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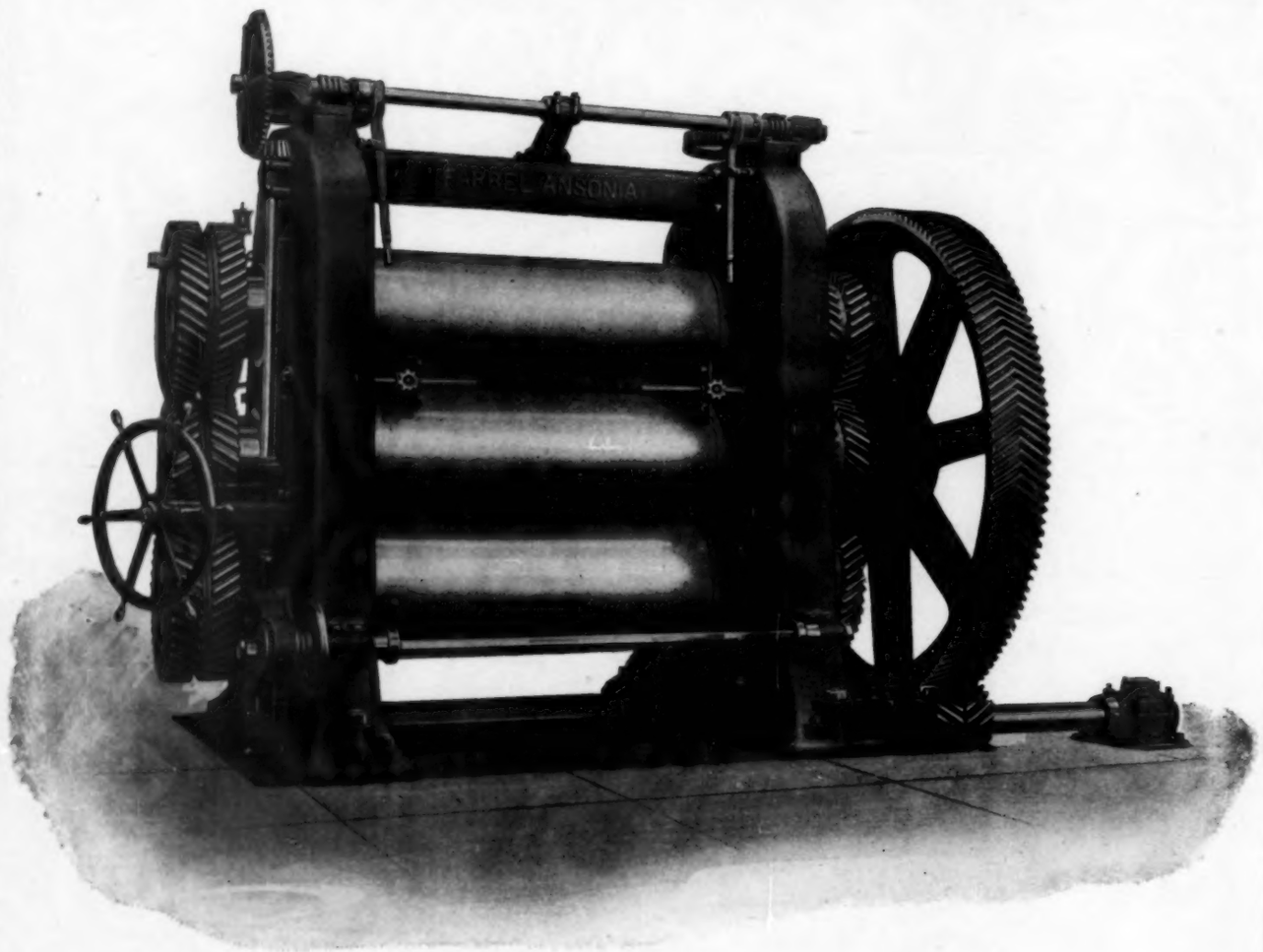

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THE RUBBER AGE AND TIRE NEWS

Chemicals and Inner Qualities of Rubber

By Dr. O. de Vries

Based Partly on Experiments by H. J. Hellendoorn, Dr. N. L. Swart, Ir. J. C. Hartjens and Dr. A. J. Ultee

This paper contains a review of experiments with some of the most commonly used chemicals, viz:

Anti-coagulants: sodium sulphite, formalin, soda; anti-oxydants: sodium bisulphite, sodium thiosulphate; and the closely related substances: sodium acetate, sulphurous acid.

Sodium Sulphite

The addition of sodium sulphite to the latex gives a small improvement in the properties of the rubber. The usual quantity of 1 gr. crystalline sodium sulphite in 20 per cent solution per liter of 15 per cent latex gives an increase in tensile strength of 0.0 to 0.03 kilos per square millimeter, the standard time of cure diminishes by 5 to 10 minutes, the slope of the stress-strain curve by 1 to 1½, the viscosity index shows an increase of 0.02 to 0.04. These figures hold for the preparation of crepe; in making smoked sheet the effect on the inner qualities may be twice to three times as large. This improvement in inner qualities, small though it may be, seems to place sodium sulphite in the first rank as an anti-coagulant, insofar as the somewhat slower rate of drying of the rubber does not constitute a drawback.

Formalin

Formalin has just the opposite effect on the inner qualities of the rubber. Rate of cure and viscosity show a marked decrease, tensile strength and slope deteriorate somewhat. For the usual dose of ½ cc. commercial formalin (diluted 1 : 40) per liter of latex the tensile strength of crepe rubber diminishes by 0.0 to 0.02 kilos per square millimeter the standard time of cure shows an increase of 2 to 5 minutes, the slope of 0 to ½, whilst the viscosity index decreases by 0.02 to 0.05. For larger quantities of formalin the effect is greater, whilst for smoked sheet the difference may be still greater. The deterioration of the rubber, though always evident, for the usual amount of formalin is not so large as to cause a serious drawback, the differences in figures remaining well within the limits of the ordinary variation of plantation rubber. But as in actual estate practice stronger doses cannot always be avoided, the inner qualities of the rubber might be seriously injured.

All these experiments, where formalin is used as an anti-coagulant in the ordinary quantities, show the same changes in inner qualities.

Several experiments were made to investigate what the mechanism of this action of formalin may be.

The effect of adding a substance such as formalin to the latex may be caused in three ways:

1. The rubber during coagulation may enclose some of the substance, and thus the substance itself or its reaction products may cause the change in rate of cure, viscosity and so on.

2. The addition of the substance to the latex may cause such changes in the latex that the rubber in coagulating encloses serum substances in a proportion other than usual, this causing a change in inner qualities.

3. The addition of a disinfectant to the latex may inhibit the changes (putrefaction and so on) which naturally takes place in latex or coagulum, and thus prevent the improvement in inner qualities caused thereby.

To investigate these points, the effect of formalin on rolled coagulum (wet or dry) was first studied, as case 2 is thereby excluded. Soaking the coagulum in formalin after rolling, or soaking the dry crepe in formalin, gave a distinct retardation of rate of cure and a decrease in viscosity.

To eliminate the dissolving action of the formalin-solution and at the same time the eventual effect of by-products as methylalcohol and formic acid occurring in commercial formalin, the experiment was repeated by placing the crepe in vapors of formaldehyde, i. e., in a glass vessel above commercial formalin. The effect remained the same.

As a further proof powdered tablets of solid formalin (para-formaldehyde) were added to the rubber when mixing with sulphur before vulcanization.

Result: marked retardation of rate cure.

We have made several experiments to settle these points, as Eaton and Grantham[1] have formulated a somewhat different opinion as to this effect of the addition of formalin. Their conclusion " the action of formalin is partly though not to any great extent an action on the accelerating agent after its formation " is, as will be seen from the above mentioned experiments, not exact. Formalin exerts the same action on ordinary crepe, which does not contain the " accelerating agent," and its retarding effect on vulcanization or the decrease in viscosity may be supposed to be due to a catalytic action of the formalin itself or to its effect on the ordinary compounds of rubber. The effect is the same on ordinary rubber as on rapid vulcanizing slabrubber.

That the effect of substances as formalin may be much larger when it also acts as a disinfectant, has been sufficiently proved by Eaton and Grantham (l. c.) We may add the following striking figures for the standard time of cure from one of our experiments:

	Coagulum rolled	
control	after 2 hours	after 24 hours
with formalin	> 130 min.	120 min.
	135 min.	135 min.

When rolled 2 hours after coagulation, the difference in time of cure

[1] Journ. Soc. Chem. Ind. 35, 718.

between control-crepe and formalin-crepe is less than 5 minutes; when rolled 24 hours after coagulation, the difference is 15 minutes, and from the figures it will be seen that, strictly speaking, this is not a "retarding effect of formalin" but an "accelerating effect of keeping after coagulation."

Soda

Soda (ordinary washing soda), used as an anti-coagulant, takes a place between sulphite and formalin. Its effect on the inner qualities is small. In the usual quantity of 2 gr. crystalline soda in 20 per cent solution per Liter latex we found an increase in tensile strength of 0.0 to 0.04 kilos per square millimeter; the time of cure diminished by 3 to 10 minutes, the slope by 0 to 1, whilst the index of viscosity showed an increase of 0.02 to 0.04. The effect of larger quantities may be somewhat greater.

Sodium Bisulphite

The use of sodium bisulphite in the preparation of pale crepe as well as its effect on the inner qualities have been fully discussed by Beadle, Stevens and Morgan[2] in their original paper. Ultée[3] added some data on the percentage of ash (which remained the same) and the viscosity (which showed an increase). Eaton and Grantham[4] however in preparing creperubber sometimes found an increase, sometimes a decrease in rate of cure, and express the opinion that the action on smoked sheet may be injurious.

We made several experiments with bisulphite, as we needed numerical data about its effect on the inner qualities (to judge of its influence on the uniformity of the product) and found for the usual quantity of ½ — 1 gr. bisulphite per Liter latex an increase in tensile strength of 0.0 to 0.05 kilos per square millimeter, a decrease in time of cure of 5 to 10 minutes, in slope of 1 to 1½, whilst the index viscosity increased by 0.03 to 0.15. For larger quantities of bisulphite the effect is greater.

This improvement in the inner qualities was to be expected after what we found for sodium sulphite; for by adding acetic acid both give the same decomposition products, viz. sodium acetate and sulphurous acid. We come back to this point lower on.

The effect of bisulphite, when rolling the coagulum shortly after coagulation, is always the same, viz., a distinct, though small, improvement in all qualities. However in this case also the effect may be obscured by another factor coming into the play, viz., the disinfectant action of bisulphite. Whilst with formalin the action of the chemical itself and its effect as a disinfectant went in the same direction (retardation in rate of cure and decrease in viscosity), for bisulphite the effect is opposite, bisulphite itself improving the inner qualities, whilst as a disinfectant it inhibits the improvement caused by putrefactive changes. This may be illustrated by the following figures for rate of cure:

	Coagulum rolled	
Control	after 2 hours	after 24 hours
bisulphite 1 gr.	130 min.	115 min.
	125 min.	120 min.

The effect of bisulphite, when rolling the coagulum shortly after coagulation, is a decrease in time of cure of 5 minutes. When rolling 24 hours after coagulation however the bisulphite-crepe shows an increase in time of cure of 5 minutes against the control-sample; strictly speaking the rate of cure of the bisulphite-crepe has increased by keeping overnight (120 against 125 minutes) but the increase for the control sample was so much larger (15 minutes), that the bisulphite-sample was "overtaken."

This may give an explanation, why Eaton and Grantham (l. c. page 445) found an accelerating effect of bisulphite when rolling shortly after coagulation, whilst with slabrubber bisulphite retards the rate of cure (which we can confirm from several of our own experiments, to be published at a later occasion).

Sodium Thiosulphate

This substance was sometimes used in the beginning of the war, when bisulphite was scarce. Ultée[5] found that the viscosity decreased somewhat; the anti-oxydative action is not so strong as with bisulphite, so that larger quantities are necessary, whilst the price is higher, so that bisulphite is by far to be preferred.

We made several experiments on an estate where thiosulphate was in use for a long time, and prepared several series in the Central Rubberstation. The result was in all cases a very small decrease in rate of cure and viscosity, whilst the difference in tensile strength and slope can be ignored.

Sodium Acetate

As from several of the chemicals used (sulphite and bisulphite, soda, thiosulphate) sodium acetate is formed after the addition of acetic acid, we investigated as to how far the effects obtained might be due to the action of this substance.

Our experiments showed that rate of cure and viscosity are increased somewhat; the improvement in tensile strength and slope, if existing, is very small.

As for the rate of drying, the addition of sodium acetate seems to accelerate it somewhat, though our experiments on this point are not conclusive.

Sulphurous Acid

We used a 0.95 N solution of SO_2 (prepared from bisulphite). Used in the proportion of 1 H_2SO_3 on 165 rubber the coagulating power was comparable with acetic acid 1:150, so that in weight 0.9, and in molecules 0.66 sulphurous acid have the same effect as 1 acetic acid.

Sulphurous acid as a coagulant has a favorable influence on the inner qualities of the rubber (as compared with acetic acid) and shows a small increase in tensile strength and viscosity, a marked decrease in slope, whilst the rate of cure, even for increasing quantities of sulphurous acid, remains the same.

From the above data it will be clear that the increase in rate of cure caused by sulphite and bisulphite is due to the formation of sodium acetate. As 1 gr. crystalline sodium sulphite gives 0.65 gr. sodium acetate (anhydrous $NaC_2H_3O_2$) and 1 gr. bisulphite (anhydrous) nearly the same amount, viz.: 0.79 gr., the decrease in time of cure found in our experiments and amounting to 5—10 minutes both for sulphite and bisulphite, is explained thereby.

On the other hand the decrease (improvement) in slope of 1 to ½ both for sulphite and bisulphite must be caused by the sulphurous acid, which (see tables 38—40) in all quantities used gives a decrease in slope of 1 to 2.

As both sodium acetate and sulphurous acid gives an increase in tensile strength and viscosity, one does not wonder at finding this also for sulphite and bisulphite.

The somewhat slower rate of drying of the rubber caused by sulphite and bisulphite must probably be ascribed to the sulphurous acid and not to the sodium acetate (as was formerly supposed by Barrowcliff[6]).—*The India Rubber Journal.*

[2] I. R. J. 46 (1913) 222, see also Beadle & Stevens, Rubber Recueil 1914, page 357; Morgan, The Preparation of Plantation Rubber, p. 69.

[3] Rubber Recueil 1914, p. 391.

[4] Agric Bull. F. M. S. 111 (1915), p. 225 and 445.

[5] Publications Ned. Ind. Landbouwsyndicaat VII, page 66 (Lecture held at Banjoewangi).

[6] Agric. Bull. F. M. S. 1 (1912), p. 11.

Determination of Permeability of Balloon Fabrics

By Junius David Edwards*

Effect of Experimental Conditions on Apparent Permeability

In order to interpret tests made under different conditions and with different apparatus, the effect of experimental conditions on the apparent permeability was investigated. The apparatus shown in Fig. 3,† with various modifications, was used for all the work reported in this section. The general conclusions reached are applicable to all apparatus of this type whether the hydrogen is determined by combustion or by use of an interferometer; the operating details of the apparatus, however, may be quite different. The interferometer was used in preference to the combustion method because it greatly facilitated the testing work in point of speed and accuracy and permitted the carrying out of certain experiments which would otherwise have been impossible of execution.

(*a*) *Effect of Temperature on Permeability.*—It has been known for a long time that the permeability of rubber films increases rapidly with increase of temperature.[10] For this reason it is necessary in all accurate work to maintain the fabric at a constant temperature during the period of test.

The rate of change of permeability with change of temperature for a number of different fabrics is shown in Fig. 5. In determining these curves the cell containing the fabric was mounted in an air bath, which was maintained at the desired temperature by means of an electric heater controlled by a thermostat. The fabric was allowed to come to equilibrium and its permeability determined at each temperature before changing to the next temperature. Curves 10,449, 10,451, and 10,650 show the temperature coefficients of fabrics from three American manufacturers and curve 10,568 is for a fabric of foreign manufacture. These curves are all very similar in shape, indicating that, approximately at least, the same relation between permeability and temperature holds for fabrics of quite different composition. For purposes of comparison, another curve showing the change of permeability with temperature as determined by other experimenters is included. This curve *A* is taken from the report of Gibbons and Smith;[11] it shows substantial agreement with the Bureau's results. Frenzel[12] gives graphs for four continental balloon fabrics. They show a smaller rate of change than any of the preceding curves and indicate the change of permeability to be a linear function. None of the fabrics examined by this Bureau have shown a linear relation between temperature and permeability. Communications from private testing laboratories here and abroad show temperature effects corresponding to those obtained at the Bureau and do not indicate a linear relation. Two tests at two different temperatures by Rosenhain and Barr[13] indicate a somewhat more rapid increase of permeability with increase of temperature. Their data are insufficient to warrant any general conclusions, however.

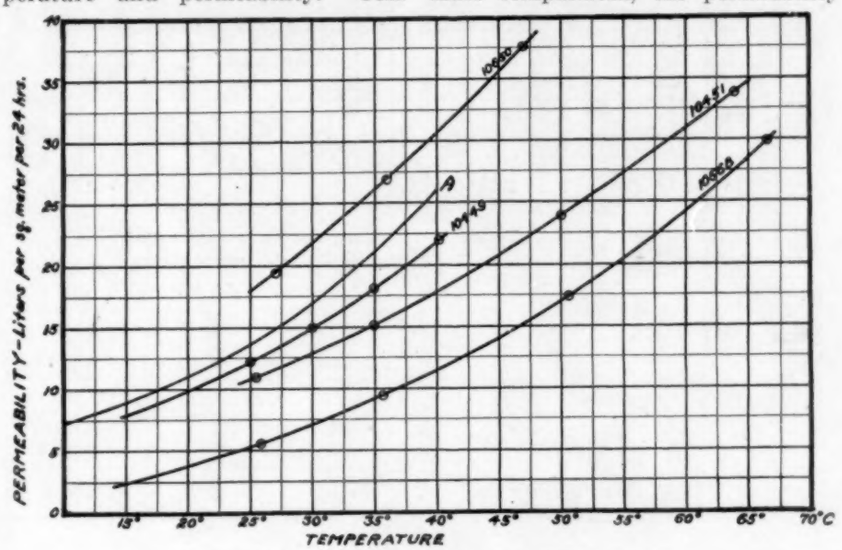

FIG. 5—EFFECT OF TEMPERATURE ON PERMEABILITY

In order to make the tests comparable, the Bureau of Standards has adopted the practice of making all tests at a standard temperature of 25 deg. C. This temperature was adopted because of the ease and convenience with which the testing apparatus could be maintained at this temperature, and because it was thought to represent with some degree of approximation an average balloon temperature.

The National Physical Laboratory, England, has adopted 15.5 deg. C. (60 deg. Fahr.) as its standard temperature. That temperature cannot be maintained in most American testing laboratories in summer without refrigeration, which needlessly complicates the testing. The customary practice in France is to use 15 deg. C. as the standard temperature. However, temperature control of the Renard-Surcouf balance, which is the most widely used instrument there, is rather difficult, and it is not known what degree of uniformity there is in temperature control in French practice. For the purpose of approximate comparisons, the permeability of the average rubberized fabric at 15 deg. C. may be taken as 65 per cent of the permeability at 25 deg. C.

(*b*) *Effect of Pressure on Permeability.*—It has been customary, both here and abroad, to determine the permeability of balloon fabrics under a pressure of hydrogen equivalent to 30 mm. of water. This is approximately the normal working pressure of a nonrigid balloon.

The pressure coefficient for two-ply balloon fabrics has been found to be rather small. The rate of change of permeability with change of hydrogen pressure for three fabrics is shown in Fig. 6. The change in permeability with change in pressure is very small, above 50 or 60 mm. the curve being almost horizontal. The greater effect of pressure change at low pressures may be due, as suggested by Frenzel, to the fact that the initial increases of pressure stretch both the rubber film and the supporting fabric, but the point is soon reached where further stretch of the rubber film is prevented by the relatively inelastic fabric, and thereafter the permeability shows only a very small change. The effect of pressure as well as of temperature varies somewhat with different fabrics, but with those tested it was small. This is to be expected, since an increase of hy-

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* Associate Chemist, Bureau of Standards in Technologic Paper of the Bureau of Standards, No. 113. Continued from the July 25 issue of THE RUBBER AGE AND TIRE NEWS.

† See the last issue.

[10] Graham, Phil. Mag., 32, p. 401; 1866.

[11] First Annual Report of the National Advisory Committee for Aeronautics (Washington, 1915), p. 171.

[12] Frenzel, "Uber die Gasdurchlässigkeit der Ballonstoffe." Drückerei des Elsässichen Textilblattes im Gebweiler.

[13] Report, Great Britain Committee on Aeronautics, p. 60; 1910-11.

drogen pressure of 10 mm. of water (0.74 mm. of mercury) means an increase of only about 0.1 per cent in the total pressure of the hydrogen.

Since the permeability is approximately proportional to the partial pressure of hydrogen (see p. 22), the permeability should vary with the atmospheric pressure, because the partial pressure of the hydrogen is equal to the atmospheric pressure plus the constant excess pressure under which it is confined in the cell. However, the changes in barometric pressure are usually small, seldom more than 1.5 per cent; accordingly, they have been neglected in routine testing since their effect upon permeability, as far as can be ascertained from an examination of test results, is within the limits of experimental error. It should be noted that it is the excess gas pressure above atmospheric which produces the greatest part of the increase noted at the beginning of the curves shown in Fig. 6.

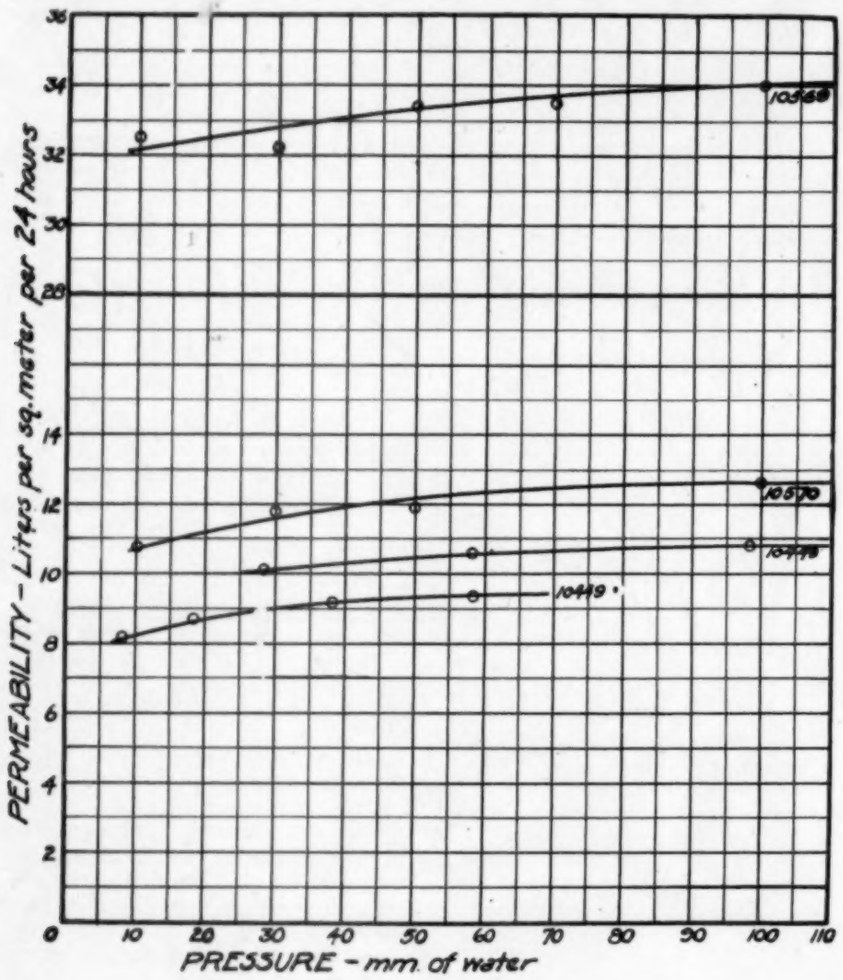

Fig. 6—Effect of Pressure on Permeability

(c) *Effect of Humidity of Hydrogen and Air.*—The influence of moisture upon the permeability was determined by comparing the permeability shown when using dry hydrogen and air with the permeability when using moist hydrogen and air. When dry gas was to be used, it was passed through concentrated sulphuric acid; when moist gas was employed, it was passed through sulphuric acid of such concentration that the relative humidity of the saturated gas was approximately 65 per cent at 25 deg. C.

The permeability of a fabric was determined with dry gas and then with moist gas; the order was then reversed. The same difference was noted in each case when testing under the two different conditions. The average results of these tests are given in Table 1.

Table 1.—Effect of Humidity of Hydrogen and Air on Permeability

Order of test	Condition of hydrogen and air	Permeability, liters per square meter per 24 hours	Difference
First test	Wet	13.8	...
Second test	Dry	14.4	0.6
First test	Dry	15.1	...
Second test	Wet	14.5	.6
First test	Wet	13.7	...
Second test	Dry	14.5	0.8
First test	Dry	14.6	...
Second test	Wet	13.9	.7

When the hydrogen is 65 per cent saturated at 25 deg. C. there is approximately a 2 per cent decrease in the partial pressure of the hydrogen due to the addition of water vapor. This partially explains why a 4 to 5 per cent decrease in permeability was noted when changing from dry gas to wet gas. The amount of water dissolved in the rubber probably also influences the rate of penetration of the rubber by the hydrogen.

Tests showed that the moisture contained in the fabric was not completely removed by a current of dry air at 25 deg. C. after a number of hours' passage, so that it is certain that the rubber compounds under the conditions of test with dry gas still contain an appreciable amount of water vapor.

No further experiments on the effect of moisture were made, since it was evident that the difference in permeability under the two conditions of test was small—less than 1 liter in this case. For testing purposes the conditions of test which are recommended should be easily obtained and duplicated, and it is obvious that the use of dry hydrogen and air is most satisfactory in every respect. It does not introduce further complications in calculations and testing, and gives results very close to those obtained with partially saturated gas.

(d) *Effect of Volatile Substances in Fabric.*—The apparent permeability may be affected by the removal of volatile substances from the fabric by the current of air passing over it. There may be present in the air stream after passing over the fabric varying amounts of water vapor, carbon dioxide, or the vapor of benzol, gasoline, or other solvent used in the manufacture, in addition to the hydrogen which has penetrated the fabric. The water vapor and carbon dioxide which may have been dissolved in the rubber are removed by soda lime and calcium chloride before the air stream enters the interferometer. In case the combustion method is used, only the water vapor need be absorbed.

The presence of vapor of solvents, however, introduces a possible serious source of error into either method. If the hydrogen is estimated by use of the interferometer, the apparent permeability is too low, because the refractivity of solvent naphtha or benzol is higher than the refractivity of air or hydrogen. If the combustion method is used, the results are too high by the amount of water formed by the combustion of the solvent. This point should be carefully considered when testing fabrics of very recent manufacture, and it is of great importance in the commercial

control of fabric manufacture. It is usually assumed that the solvent used in the rubber coatings when they are spread is entirely removed by the subsequent heating and curing. In some cases, notably three-ply fabrics with heavy rubber coatings, sufficient solvent may be left to seriously vitiate test results unless it is removed or corrected for. Its presence can sometimes be detected from the odor of the fabric.

The necessary correction for solvent vapor can be readily found by determining the reading of the interferometer when using air in place of hydrogen in the permeability cell. Since the amount of solvent given off by the fabric decreases with time, it is necessary to take at least three readings at short intervals to determine the rate of change of the blank; the correction at the time of the permeability test, which should follow immediately, is estimated by extrapolation. This method does not necessitate waiting for the complete removal of the solvent before beginning the test, and for most purposes is sufficiently accurate. It is of course obvious that a more accurate method would be to wait until the solvent is completely removed, thus eliminating the necessity for a blank correction.

The estimation of the blank correction is more difficult in case the combustion method is used, because it is impracticable to determine its rate of change. Its magnitude may be determined, however, and if a more accurate determination is required, a number of permeability tests can be made at suitable intervals.

Of several hundred samples tested at the Bureau only fabrics of a certain composition have shown blanks of appreciable magnitude. The possibility should not be overlooked, however, in the case of any fabric with heavy rubber coating and of very recent manufacture, particularly if the presence of solvent can be detected by the odor.

(*e*) *Duration of Test.*—The passage of hydrogen through the fabric being a solubility phenomenon, it may be assumed that a certain time must elapse after the fabric is placed in contact with hydrogen before the fabric is saturated with hydrogen and reaches its maximum permeability. The interferometer lends itself readily to the investigation of this point, since readings may be taken at short intervals.

Care should be taken not to confuse the time required for the air-hydrogen mixture to reach equilibrium throughout the apparatus with the time required for the fabric to reach equilibrium. The larger the air chamber in the cell and the greater the volume of the rest of the air system, the longer is the time required for the hydrogen given off from the fabric to reach a uniform concentration throughout the apparatus. It was with this point in mind that the cells were designed with as small gas chambers as seemed practicable.

The results of 200 representative determinations were examined to ascertain what effect the duration of the test had upon the apparent permeability. In making these determinations, which were mainly of a routine nature, the first reading was usually taken 30 minutes after starting the test. Three or four readings at intervals of approximately 30 minutes were taken in order to determine whether a constant value was being reached. These results, together with the experience obtained in some 500 other tests, show that the time required for the fabric to reach its maximum permeability is almost always less than 1 hour and usually less than 30 minutes.

Other workers have stated that periods of from 3 to 5 hours were necessary before the fabric reached its maximum permeability. Where experiment seemed to indicate this, the time was probably required for the air stream itself to reach equilibrium and not the fabric. For any apparatus the preliminary sweeping-out period should be experimentally determined.

It has been noted that in continued testing of the same piece from day to day there was usually a gradual decrease in the permeability. For example, a certain test piece (No. 52), which had an initial permeability of 15.1 liters, showed on the three succeeding days permeabilities of 14.8, 14.6, and 14.4 liters. Sometimes the decrease was more rapid; another fabric (test No. 518), showed a decrease from 21.4 to 19.2 liters in 5 successive half-hour tests. One very unusual 3-ply fabric with extra heavy rubber coatings consistently showed a large decrease; 1 test piece, for example, changed in permeability from 18.9 to 14.5 liters in 8 successive tests on the same day. The same test piece changed from 16.4 to 11.3 liters on the following day. Four months later another test piece from the same sample indicated in 5 successive half-hour tests permeabilities of 17.2, 16.1, 14, 13.6, and 12 liters. However, the great majority of fabrics tested give quite consistent and constant results during the period of test. Using the combustion method, where a considerable period of time is necessary for each test and usually only one observation is made, the changes noted above would usually pass unobserved.

A similar decrease in permeability is obtained by heating the fabric. Test piece No. 52, previously referred to, showed a permeability of 14.4 liters at the last test. Without removing it from the cell or interrupting the test its temperature was raised to 70 deg. C. and held at that temperature for 30 minutes. On lowering the temperature to 25 deg. again its permeability was found to be 10.8 liters, and on the three succeeding days it was 10.9, 10.9, and 11 liters. Another test piece showing an initial permeability of 11.7 liters was heated to 50 deg., held at that temperature for 30 minutes, and then allowed to cool again, the whole process requiring about 3 hours. Its permeability was found to have decreased to 8.5 liters. Fabric heated in an electric oven before testing and before coming in contact with hydrogen showed a similar decrease in permeability, the magnitude of the effect depending upon the temperature and time of heating. Samples exposed to the weather also gradually acquire a lower permeability. This, however, is accompanied by a hardening process, which eventually leaves the rubber film so brittle as to be useless.

This variation in the permeability of a rubber film under the conditions noted makes it impossible to use one test piece in a long series of experiments and yet secure comparable results. New pieces must be used to secure comparable samples, and they are subject to any variation due to nonuniformity of the material.

In conclusion, it may be said that the permeability of most samples remains practically constant during a day's test. Longer testing will probably show a decrease. Occasionally a fabric will be met with that shows a very large decrease during the test. Heating a fabric will produce a very appreciable decrease in permeability. An explanation of the changes occurring in the rubber which cause the changes in permeability noted will not be given at this time.

(*f*) *Rate of Air Flow.*—Tests made over an extended period with different fabrics and different permeability cells showed that, within wide limits, changing the rate of passage of air through the cell did not make any significant change in the apparent permeability. The air rate in both large (250 cm.^{2}) and small (100 cm.^{2}) cells was varied from 1 to 3 liters per hour; the normal rates were 1.5 and 2.5 liters per hour. The tendency toward slightly higher results when the rate was increased was occasionally noted, but the effect was not consistently observed; usually any change was well within the accidental variations in the results. It may be concluded, therefore, that

within working limits, differences in the air are unimportant as affecting the result. It should be noted, however, that a uniform air rate must be maintained during the test in order to secure satisfactory results. This is especially important where the interferometer is being used, since it is assumed that the concentration at the time of observation is the same as during the preceding period when the rate was being determined by the meter; this would only be true in case the permeability and rate of air flow remained constant.

(*g*) *Effect of Size and Shape of Cell on Apparent Permeability.*—The size and form of the cell might have an effect on the apparent permeability of a fabric being tested in it if the cell did not permit uniform circulation of the hydrogen and air currents over the entire area of the test piece. If the air is not readily swept out of the hydrogen chamber or if the hydrogen passing through the fabric is not uniformly removed by the air stream, the results with different cells might vary. The significant factors of cell design have been examined to determine what effect they have upon the apparent permeability.

The first point considered in the design of the cell was the size of the test piece and the form of the hydrogen and air chambers. The method depends of course upon reaching an equilibrium condition throughout the system with practically pure hydrogen on one side of the fabric and a uniform distribution throughout the interferometer system of the hydrogen passing through the fabric. Therefore, the smaller the volume of the gas chambers in the cell, the sooner will this equilibrium condition be reached, providing, of course, that the fabric is being penetrated by hydrogen at its maximum rate under the given conditions. On the other hand, the area of the test piece must be large enough to give sufficient concentration of hydrogen at a suitable air rate for the required accuracy in the interferometer reading.

For most work a test piece having an area of 250 cm.^{2} is satisfactory. The construction of the cell adopted as standard is shown in Fig. 4. The hydrogen chamber has a depth of 2 mm.; the pressure of hydrogen (30 mm. of water) is sufficient to keep the fabric from coming in contact with the cell wall. The air chamber is 4 mm. deep; to prevent the pressure of the hydrogen from forcing the fabric against the opposite side of the chamber a large mesh wire screen is placed in the cell. Three cells of this type and a fourth exactly similar, except that the air chamber is 6 mm. deep, are in constant use. Intercomparison shows that all four give practically identical results with the same fabric. Equilibrium is reached very quickly with a cell of this type.

A smaller cell having an area of 100 cm.^{2} and a hydrogen chamber 20 mm. deep was modified by filling up the hydrogen chamber with paraffin until the gas space was only 2 to 3 mm. deep. With the original hydrogen chamber of 20 mm. depth the fabric did not reach its maximum permeability until several hours after starting the test, even though the rate of passage of the hydrogen was several times the normal rate. With the hydrogen space restricted a constant permeability was reached 30 minutes after starting the test.

The cells are normally used in a vertical position. To determine whether this had any effect on the result, a cell was operated in various other positions. As was to be expected, no effect due to position was observed.

In a similar manner the effect of direction of gas flow was tested. With a cell suspended in a vertical position it made no difference in the apparent permeability whether the air was introduced at the top or at the bottom of the cell. In operation it is our practice to introduce the hydrogen into the cell at the top and the air at the bottom, on the theory that the cell will be swept out more rapidly. It probably makes little, if any, difference, however, if the chambers are small and the gas current sufficiently rapid.

To determine what effect the area of the test piece had on the apparent permeability, cells of different sizes were constructed. These cells had fabric areas of 50, 100, 250, and 1000 cm.^{2}

If the hydrogen which passes through the fabric is not rapidly removed from the surface, the partial pressure of the hydrogen might become sufficiently great to lower the apparent permeability appreciably. Any such increase of the partial pressure of hydrogen at the surface of the fabric is prevented by the high rate of diffusion of hydrogen. The accumulation of hydrogen in the cell is prevented by the current of air which reduces the average concentration of hydrogen in the cell to 1 per cent or less. For these reasons it is to be expected that the apparent permeability would be independent of the rate of air flow and of the area of exposed fabric within rather wide limits.

The results of a series of tests with these cells showed that these conclusions were substantially correct. The small (50 cm.^{2}) cell gave practically the same apparent permeability as the 250 cm.^{2} cells but the results were less concordant. The agreement between the 100 and 250 cm.^{2} cells was very good. With the 1000 cm.^{2} cell apparently a longer time was required to reach equilibrium.

If the hydrogen is able to penetrate laterally between the plies, the effective area of exposed fabric may not be defined by the edge of the gas chamber but may be somewhat larger. This edge effect would of course be proportionally greater in a small cell than in a large one. No such consistent difference was noted. It has been found, however, that where a heavy cloth, with its consequently coarser texture, is used in the construction of the fabric, or where a light cloth is used but the rubber does not penetrate between the threads that such edge leakage occurs; the resulting apparent permeability is high depending upon the relation of the area of the margin of the test piece to the area of the gas chamber. If the fabric has no rubber on one of its outer surfaces the proper application of vaseline to the margin will seal the fabric and prevent leakage past the edge. However, if there is a coating of rubber on both sides, the vaseline cannot penetrate the rubber and seal the fabric. The best way of reducing the error from this source in the second case is to reduce the marginal area to a minimum and to apply hot vaseline to the edge of the test piece.

(*h*) *Concentration of Hydrogen.*—The tests discussed so far were made with hydrogen of approximately 100 per cent purity. If the concentration of the hydrogen in contact with the fabric be reduced by admixture of air, it seems probable that the apparent permeability of the fabric to hydrogen will be reduced about proportionally. Barr and Thomas[14] conclude from two experiments with mixtures of air and hydrogen that the permeability is directly proportional to the partial pressure of the hydrogen.

No tests of this point have been made as yet at the Bureau, since for testing purposes the use of pure hydrogen is desirable from every standpoint and it is known that if the hydrogen contains air, the apparent permeability to hydrogen will be reduced about proportionally. This is an important point to consider in connection with volume-loss methods, since the diffusion of air into the hydrogen chamber will lower the partial pressure of the hydrogen and consequently the apparent permeability.

(*To be continued*)

[14] Report Great Britain Committee on Aeronautics, 4, p. 270: 1912.

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THE RUBBER AGE AND TIRE NEWS

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THE tire manufacturers are seemingly growing somewhat accustomed to the curtailment that was "requested" by the War Industries Board, and less complaint is now heard than when the order was first issued. However, many of the small manufacturers are dissatisfied with the situation and make no hesitation in expressing the opinion that the basis of curtailment is working a hardship on them. That this is true in factories that have no Government orders there can be no doubt—and Government orders seem difficult to be obtained by any but the big manufacturers, which is a very natural and logical condition.

After the Waldorf-Astoria meeting of the War Service Committee with its representative attendance of rubber manufacturers as guests, there was some talk of forming a separate organization that would give its particular attention to the interests of small manufacturers. Fifty-six manufacturers did actually meet in Akron and from the meeting two delegates were sent to Washington to air their grievance before the War Industries Board, only to be referred back to the War Service Committee, it is said. No changed conditions resulted, and it is evident that the War Service Committee still remains the proper medium through which complaints should be brought before the War Industries Board.

Half of the period of the present curtailment has practically elapsed and no reports have been received of tire factories shutting down—those most affected by the curtailment are probably existing by filling orders partly from their decreasing stocks on hand and are hoping for better times to come.

What curtailment will be demanded after September 30, no one will predict, but it seems that no hope is held out that the conditions will be more favorable to the manufacturers than they are now, and in many quarters it is believed that before long more drastic restrictive measures will be put into effect. In fact with severe curtailment in production and the greater shortage of labor caused by the new draft, combined with decreased demand caused by the restriction placed on the use of gasoline for pleasure cars on Sundays, the position of manufacturers who are not fortunate enough to obtain Government orders may become far from inviting.

Standardizing Motor Transport Equipment

All motor transport for the War Department, including the purchase of tires and accessories, has been taken over by the Motor Transport Corps of the Army. Its Engineering Department has already standardized the motor cars and trucks and the solid tires that are to be used on them, and now they are at work standardizing equipment of pneumatic tires and accessories.

Reclaimed Rubber

The newer tire manufacturers are not as familiar with the use of reclaimed stock as are the older concerns. This is probably due to the fact that the younger concerns had the good luck of entering the business at a time when crude rubber was at a price permitting its extensive use, and, consequently, have not been forced to use the reclaimed article. True it is that many of the technical men in the newer companies have been through times when a wider use of regenerated stock was customary; but now these men have to cater to the ideas of shareholders and directors who have the anchored opinion that "pure Para" alone can make a good tire.

The sum of the output of these smaller and newer manufacturers makes a very imposing figure, which, in view of their weakness for fresh rubber, is perhaps not entirely foreign to our huge national consumption of crude rubber, which continued to grow after the Government first requested economy in its use, and which is perhaps not unrelated to the more drastic measures recently taken.

Millions of dollars of scrap rubber is lying useless in this country, and apparently will continue to do so until some political appointee picks up this point. Then we will hear a big howl about the wasteful extravagance of the manufacturers of automobile tires who might have used their trimmings and other waste materials and effected a great saving.

The small tire manufacturer is having much trouble just now, and it is quite possible that his troubles will be greater after the war is won, when, if crude rubber is in big demand, as may well be expected, the larger manufacturers and foreign interests may grab and control the available supply. Then it will be worth while to know how to make good tires from stocks containing high percentages of reclaimed rubber.

Would it not be wise for small manufacturers who have not already acquired the knowledge to start now and learn how to use it? Such information should be valuable after the war, when high-priced crude rubber is almost a certainty.

Government Action Affecting Rubber

To Encourage Use of South American Rubber—Gutta-Joolatong Imports—Rubber Shrinkage Allowances and Imports Fixed—Forms for Advance Allocation—Fourth Liberty Loan

To Increase Use of American Rubber

To carry out the desire of the War Trade Board to bring forward a substantial amount of Central and South American rubber, the Bureau of Imports of that body has determined that during the present months of allocation rubber used in Government work will be replaced by issuing allocation certificates therefor as follows: Fifty per cent to be Central or South American rubber; 50 per cent for rubber from any source.

Allocation certificates so issued and designated to be for Central and South American rubber can only be used in support of an application for an import license from these countries.

Manufacturers holding Government contracts will kindly take due note of the above ruling.

There will, of course, be no objection to manufacturers using their usual allocation certificates for purchasing Central or South American grades, but there will be issued a distinct allocation certificate calling for the replacement of rubber used in Government contracts that will only be good in support of a license calling for shipment from these countries.

Manufacturers have been credited by the War Trade Board with the remaining 25 per cent of the August-September allocation and applications to the extent of 75 per cent of the probable August-September consumption upon Government business will be granted on the basis of one-half calling for Central or South American rubber and one-half rubber from any source.

Importation of Gutta-Joolatong

The restriction imposed by the War Trade Board upon the importation of Gutta-Joolatong (variously known as Jelutong and Pontianac) has been modified, in a new ruling (W. T. B. R. 193), to the extent of permitting the importation of a limited amount necessary for essential purposes in this country during the remainder of the calendar year. The amount so licensed will be allocated by the Bureau of Imports of the War Trade Board among manufacturers in accordance with their requirements for the production of commodities essential to the successful prosecution of the war.

Priority Certificates

Edwin B. Parker, priorities commissioner of the War Industries Board, has issued a letter pointing out to manufacturers and the public generally the uselessness and inadvisability of employing agents to obtain priority certificates or preference treatment from the Board. The letter follows:

TO THE PUBLIC:

The attention of the Priorities Division of the War Industries Board has been called to the fact that certain individuals are offering their services and soliciting employment to present priority applications and procure the issuance of priority certificates, and also to use their alleged influence in having industries accorded preferential treatment.

The rules and regulations of the Priorities Division are clear, simple, can be readily followed and will be furnished to anyone applying therefor. The employment of agents not only burdens the applicant for priority with a wholly unnecessary expense, but an attempt on the part of such agents to exert personal influence—which it is needless to say they do not possess—may have a tendency to prejudice the applicant's cause.

EDWIN B. PARKER,
Priorities Commissioner.

Preparations for Fourth Liberty Loan

Bertram G. Work, president of The B. F. Goodrich Company, 1780 Broadway, New York City, has consented to act as chairman of the Committee of the Rubber Industry of Greater New York for the Fourth Liberty Loan, according to an announcement made by George de B. Greene, chairman of the Advisory Trades Committee of the Rainbow Division of the Liberty Loan.

There are ninety committees on this division's roster, which represent all the industries of the metropolis, and it is hoped that active work can be started a full month earlier than in any of the previous drives.

While trades in New York have set no quota for their share in obtaining subscriptions for the new loan, which is to be floated on September 28, it is anticipated that they will raise about half the total of the city. The trades total during the last drive was more than $550,000,000.

Canvassing for the Fourth Loan will be facilitated by a master list containing 120,000 names and ratings of firms. Every firm is listed according to the industry to which it belongs. Each subcommittee will be supplied with a list so that not a single business concern will be overlooked in soliciting subscriptions.

A Community Honor Flag will be awarded to firms sixty per cent. of whose employes have bought bonds. The firm percentage will be written in at the bottom of the white field of the flag.

In the fourth drive the trade committees will again be listed according to their estimated wealth. There will be three classifications: firms capable of raising $10,000,000 or above; firms who should raise from $2,000,000 to $10,000,000, and firms raising under $2,000,000.

Advance Allocation Forms

The Rubber Association of America, 52 Vanderbilt Avenue, New York City, has ready for distribution the forms to be used in making application for advance allocation certificates for 75 per cent of the amount of rubber to be consumed in filling Government contracts during August and September.

Manufacturers having such contracts and desiring to make application for advance allocation certificates will be supplied with these forms upon request.

Rubber Imports Fixed

After a study of the situation regarding supplies of crude rubber in this country, the rate of consumption and related questions, and after consultation with the War Industries Board, the War Trade Board has decided to permit the importation of crude rubber during August and September at the rate tentatively fixed for the quarter ended July 31, 1918, 100,000 tons a year. The quantity of crude rubber to be licensed for importation during August and September has, therefore, been limited to 16,666 tons. This amount will be allocated by the Bureau of Imports of the War Trade Board along the general lines of the previous allocation, certain changes having been made therein to take care of new manufacturers and increased Government requirements, as was reported in full in the August 10 issue of THE RUBBER AGE AND TIRE NEWS.

Rubber Shrinkage Allowances

In connection with the sales and purchases of South and Central American grades of crude rubber, the War Service Committee of the Rubber Industry of the U. S. A. recommends that they be made upon the basis of shipping weights in pounds, or tons of 2240 lbs. each.

Slight differences in transit shrinkages may occur on the same grade of rubber, and for this reason shiping weights are a fairer basis to both seller and buyer, as the exact loss in transit cannot be predetermined.

Here is a list of shrinkage allowances for the various grades. These shrinkages are the maximum allowed by the War Trade Board to cover loss between shipping weight and the final dry weight in the factory.

The manufacturer in making out his allocation certificate should compute the amount in accordance with the table, which shows the percentage of the allocation to the shipping weight. For example: Ten tons shipping weight of Fine Para is equal to 22,400 lbs., and 75 per cent of this amount, or 16,800 lbs., would be the amount of the allocation certificate. The importer in return for this certificate would receive an import license for 10 tons shipping weight.

By using the various percentages given in the table for the various grades the manufacturers should have no difficulty in arriving at the proper amount of the allocation certificate necessary to cover a purchase. Bearing in mind, however, that tons should always be reduced to pounds on the basis of 2240 lbs. each.

Purchases already made on the basis of landed weights require a different computation to determine the amount of allocation certificate, and any one having contracts on this basis for which certificates have not already been issued may communicate with H. S. Vorhis, Secretary, care The Rubber Association of America, 52 Vanderbilt Ave., New York City, in case further information is required.

	Percentage Shrinkage allowance.	Percentage allocation should bear to Shipping Weight.
FINE PARA GRADES		
Upriver	25%	75%
Madeira	25	75
Manaos Weak	25	75
Knapsack	25	75
Peruvian Weak	25	75
Mollendo	25	75
Mattogrosso	25	75
Islands	33⅓	66⅔
Tapajos	25	75
Upper Xingu	25	75
Peruvian	25	75
Cut Angostura	25	75
MEDIUM PARA GRADES		
Upriver	25%	75%
Peruvian	25	75
Cut Angostura	25	75
Coarse-Medium (Mixed Para)	25	75
COARSE PARA GRADES		
Upriver	30%	70%
Mattogrosso	30	70
Islands	30	70
Cameta	30	70
Peruvian	30	70
Mollendo	30	70
Rio Negro Coarse	30	70
Rio Negro Strings	35	65
Nugget Coarse	30	70
Angostura Coarse	30	70
Tapajos Coarse	30	70
Xingu Coarse	30	70
Ceara Coarse (Negroheads)	30	70
MISCELLANEOUS		
Manicoba 1	30%	70%
Low Amazon Weak	25	75
Ceara Scrap 1	30	70
Pernambuco Sheet	35	65
Mangabeira Sheet	35	65
Upper Caucho Ball	25	75
Caucho Tails	25	75
Lower Amazon Ball	25	75
Upper Caucho Slab	30	70
Upper Xingu Ball	25	75
Central American Rubbers	30	70

News from Rubber Circles

Goodrich Vice-President Manages Red Cross Traffic—Rubber Association Appoints Traffic Committee—Small Manufacturers Meet—Big Goodyear Sales—News from Rubber Metropolis

Rubber Association Traffic Committee

The Board of Directors of The Rubber Association of America, in view of the many important questions continually arising pertaining to traffic matters, has deemed it advisable to appoint a permanent Traffic Committee, composed as follows: George F. Hichborn, Traffic Manager, United States Rubber Co., New York, chairman; R. G. Kreitler, Traffic Manager, The Goodyear Tire and Rubber Co., Akron, Ohio; A. D. Phillips, Traffic Manager, The Fisk Rubber Co., Chicopee Falls, Mass., and E. L. Tragesser, Traffic Manager, The B. F. Goodrich Co., Akron, Ohio.

This action was taken to harmonize and centralize in the Rubber Association all activities pertaining to freight legislation clasification and other traffic or transportation matters that affect the rubber industry as a whole.

To accomplish the best results, the Association has appointed A. L. Viles as Secretary of the Traffic Committee, effective Aug. 7, 1918. It has been decided, in order to carry out the purpose of the Association respecting traffic or transportation matters, that the Secretary of the Traffic Committee be located in the offices of the Association in New York City, his duties to be primarily as follows:

The Secretary shall be prepared to receive from the members of the Association suggestions or complaints respecting traffic or transportation matters affecting any member of the Association and to make any investigation necessary by reason of such suggestions or information.

The Secretary shall notify all interested of such matters brought to his attention and obtain opinions from them as to how it affects their particular industry. When such data has been accumulated, the Secretary will, if necessary, call a meeting of the Traffic Committee, who will formulate some general plan of action.

The industry is now confronted with the most radical change in freight classification that has ever been suggested by the carriers, namely, the proposed consolidation of the official, southern and western classifications, which has been issued in tentative form to provide uniform descriptions, carload minimums and rules, but retaining the separate ratings now carried in the issues of the three territorial clasifications.

In this proposed consolidated classification, approximately several hundred advances in rates or minimums are suggested, many of which are so great as to vitally affect the rubber industry. For example, one change increases pneumatic tires in official territory from third to second class carloads, which represents an increase of approximately 35 per cent, and this increase, coupled with the general advance in rates of 25 per cent, present a transportation burden that is believed will be very detrimental to the industry. Many similar situations exist with respect to other commodities manufactured or used by our members.

The serious situation described in the foregoing obviously demands immediate and united action on behalf of the entire Association, in order that the Interstate Commerce Commission and the United States Railroad Administration may have placed before them such information and statements as will bring about a full realization of the effect of this proposed action on a great industry.

A. B. Jones Red Cross Traffic Manager

Announcement is made by the American Red Cross of the appointment of A. B. Jones, second vice-president of the

A. B. Jones

B. F. Goodrich Rubber Company, to the post of director of transportation and distribution of Red Cross supplies in France.

H. P. Davison, head of the American Red Cross, and Major Atterbury, in charge of all American Army transportation in France, selected Jones for the task of developing closer co-ordination between military and Red Cross distribution after much consideration of other big American business men. Jones was particularly fitted for the appointment because of his former business association with Major Atterbury, former head of the Pennsylvania railroad system, and his acquaintance with other railroad officials in France.

The duties of distributing Red Cross supplies not only entail the transportation and warehousing of supplies but also the care of thousands of French people who, together with many of their possessions, are literally moved to and from the danger zones.

A. B. Jones was born at Mt. Holly, N. J. He graduated from Princeton in 1896 and immediately entered the service of the Pennsylvania Railroad Company where he worked up from rodman to divisional superintendent. He came to Akron in 1902 and in addition to his executive position in the Goodrich Company directed plant administration.

Akron Plant on War Basis

(Special Akron Correspondence)

Akron rubber plants are rapidly getting on a war basis.

Recent arrangements curtailing the output of pneumatic auto tires have resulted in the factories putting as many men as possible on Government orders and products not included in the agreement reached with Federal officials. Increases in these orders are offsetting curtailment in pneumatic tire output.

Small Companies Meet at Akron

(Special Akron Correspondence)

Representatives of 56 of the smaller rubber companies from all parts of the country met at Akron Aug. 15 to discuss problems brought about by war conditions. The meeting was preliminary, it is said by those attending, and no announcement of any action taken was made. A committee was appointed to further the organization of the smaller companies.

The smaller companies, it is said, have been hard hit by the order curtailing tire production. Unless they have Government orders, some of the plants manufacturing tires exclusively will have to close down. Their only salvation would be to get the Government to release crude rubber for them, and that seems highly improbable at this time. It is rumored that several of the new plants in the Akron district are about to close, but the manufacturers appear to be holding on as long as possible hoping for some change in conditions which would let them operate.

The officials of these companies refuse to make statements for publication now.

Goodyear Financial Statement

(Special Akron Correspondence)

Gross sales of the Goodyear Tire & Rubber Co. for the first eight months of the year totaled $88,390,432. The remaining four months, usually the heaviest of the year, should produce an additional $50,000,000, it is said. This would bring the year's business to $140,000,000, the greatest ever done by an Akron rubber company. In the 1916-1917 year, Goodyear did $11,450,000 worth of business.

The company's financial statement for the year ending October 31 will be issued in November.

Firestone Has New Plant

(Special Akron Correspondence)

The Firestone Tire & Rubber Co. is planning to have Plant 2, recently completed, in operation by the first of September. It is understood that solid tires, airplane fabric and observation balloons will be made in the new buildings. Four thousand men are to be employed in the new plant, it is said, although no official announcement has been made by the company.

The Firestone, until a short time ago, was an exclusive tire factory. The company, however, decided to go into the boot and shoe and mechanical goods manufacture, and since then many changes have been made.

Some large Government orders are being filled at this plant, and officials recently announced that the order curtailing tire production would not result in the laying off of men. Labor is hard to get and companies are making every effort to keep all the men they now have, let alone making an attempt to replace men lost for different causes.

Goodyear Balloonist Joins Navy

Ralph A. D. Preston, who has been in charge of the Goodyear Tire & Rubber Company's flying field near Akron, where instruction in ballooning is given to student officers of the Army and Navy, has received commission as lieutenant, senior grade, in the United States Naval Reserve Flying Corps. His headquarters are now in Washington, D. C., where he has been placed in charge of repairs on U. S. naval airships and will keep in touch with all work at the various naval air stations.

Items of Interest to the Trade

Sulphur Under Control—Government May Distribute Gasoline—Government Purchases of Rubber Goods—Rubber Chemists to Meet in Cleveland—Trenton Golf Tournament

Government Takes Control of Sulphur

With the approval of President Wilson the War Industries Board has determined to take over the production and sale of sulphur. The demands of the Government in the making of explosives largely influenced the decision. The American sulphur supply is derived chiefly from the mines in Texas and Louisiana, of which the average monthly output amounts to 100,000 tons. The Government requires seven-tenths of this production, leaving only three-tenths for the rubber industry and other lines of manufacture.

Gasoline Regulation Coming

Increasing demands of American forces overseas for gasoline to supply airplanes will force the fuel administration to extend the regulations in several directions.

A careful investigation by the Government has revealed that the present method of distribution is extremely wasteful, and that the product is being handled without the slightest regard for saving.

The first restriction will be the prohibition of pleasure driving Sundays.

Legitimate use of gasoline, it was emphasized, however, will not be discouraged.

A statement issued by the administration on the subject says:

"The Fuel Administration is urging every one concerned in the production, distribution and consumption of gasoline to eliminate every possible point of waste. Unless this is done there may be an actual shortage in a short time. If this condition develops, the Fuel Administration will not hesitate to make effective enforced conservation methods."

Present stocks of gasoline are ample to supply the demands, but the supply is constantly growing less, and with the expected increase over the present demands the necessity of conservation becomes emphatic.

Telegraph Work Government Business

The War Trade Board has ruled that all orders on contracts for telegraph companies are to be considered as Government business and therefore rubber consumed in such orders is subject to replacement without regard to allegation.

As yet there has been no definite ruling regarding the status of orders on contracts from the telephone companies.

Official Cotton Standards Prices

Prices for the Official Cotton Standards of the United States were increased to $45 for the set of 9 grades of white cotton, and $55 for the set of 11 grades of colored cotton Aug. 1, 1918. This is in accordance with an announcement just issued by the Department of Agriculture, which states that the increases have been made because of the rise in the price of cotton, supplies, and materials used in preparing the standards.

The cost of a fractional part of either the white or colored sets of standards is now $5 for each box or grade. New samples to replace old, in any box of the practical forms returned to the department, has been fixed at $4 exclusive of the box container, or at the rate of 40 cents for each sample when the number furnished is $5 or less in one box.

Motorcycle Manufacturers Confer

Representatives of the motorcycle industry conferred Aug. 21 with the Conservation Division on a program to effect economies in the use of metals and rubber in the manufacture of its product. The manufacturers agreed to put their experts to work on technical problems connected with various methods of effecting economies and to report within a few weeks, through the War Service Committee, which is to be organized by the industry.

The industry consumes a considerable amount of steel, copper tubing, brass tubing, tin plate and rubber. The manufacturers were asked to suggest wherein it is practicable for them to use substitutes for the metals, particularly copper and brass, which are required in the war program. They agreed to give the matter careful consideration and to make suggestions to the Conservation Division that will form the basis for recommendations by the latter.

Representatives of the industry at the meeting were: T. C. Butler, Jr., C. B. Franklin and F. J. Weschler, of Springfield, Mass.; F. B. Rodgers, Arthur Davidson, W. S. Harley and August Frey, Milwaukee; A. G. Hale and F. J. Stareck, Cleveland, Ohio.

Government Aid to Motor Truck Industry

The Priorities Division of the War Industries Board has issued a circular to truck manufacturers which states that, insofar as motor trucks are used directly or indirectly for war purposes, they are essential and their production for such purposes should be facilitated. Furthermore, insofar as trucks are employed in essential uses in civilian industry, they constitute an important transportation medium and curtailment for such uses must be avoided as far as possible.

Lacs on Restricted Imports List

The War Trade Board, has, by a new ruling (W. T. B. R. 202), placed Shellac, Button Lac, Seed Lac, Garnet Lac, and Keerie or Refuse Lac on the List of Restricted Imports. All outstanding licenses for the importation of these commodities have been revoked as to ocean shipments after August 15, 1918, and hereafter no licenses for their importation will be issued except such as will cover the following:

(1) Shipments from Canada or Mexico by other than ocean transportation.

(2) Shipments from Calcutta between the 1st day of October, 1918, and the 31st day of March, 1919, inclusive, of a total of not to exceed 5,000 tons.

(3) Shipments on vessels of the United States Navy of quantities for military or naval use.

The Trenton Outing

The Outing Committee of the Rubber Association of America, through the kindness of J. A. Lambert, of the Trenton Country Club of Trenton, N. J., has arranged to hold the annual golf tournament at the club on Wednesday, Sept. 25. An advance notice to this effect has been sent out by W. J. Kelly, chairman pro tem. of the Outing Committee of the Rubber Association. Full details of the tournament will be announced later.

Government Rubber Purchases

Recent purchases and contracts by the Government include the following:

Bureau of Aircraft Production—Firestone Tire & Rubber Co., Akron, Ohio, 436 outer casings (latest type now in production for Curtiss JN-6H advanced training planes); Faultless Rubber Co., Ashland, Ohio, 120,000 rubber toy balloons; Goodyear Tire & Rubber Co., Washington, D. C., nineteen auto tires.

Navy Department — Hamilton Rubber Manufacturing Co., Trenton, N. J., steam hose; Hewitt Rubber Co., Buffalo, N. Y., gasket sheet; Faultless Rubber Co., Ashland, Ohio, gas balloons; Belmont Packing & Rubber Co., Philadelphia, Pa., flax packing.

General Engineer Depot of the Army—U. S. Rubber Co., New York City, conductor cables and wire; Safety Insulated Wire & Cable Co., New York City, insulated cables; Easthampton Rubber Thread Co., Easthampton, Mass., rubber bands; George L. Lyon, Milford, N. Y., tire measures; Quaker City Rubber Co., Philadelphia, Pa., rubber belting; Swinehart Tire & Rubber Co., Akron, Ohio, non-skid tires; Dominion Asbestos & Rubber Co., New York City, asbestos sheet; Emanuel Baumgarten, Washington, D. C., rubber cushions; Goodyear Tire & Rubber Co., Philadelphia, Pa., air hose; Ohio Rubber Co., Cleveland, Ohio, insulating tape; Safety & Insulated Wire Cable Co., Washington, D. C., cables; Republic Rubber Co., Washington, D. C., tire casings; the Asbestos & Rubber Works, New York City, asbestos roll board; National Fibre & Insulation Co., Yorklyn, Del., packing; the B. F. Goodrich Rubber Co., Washington, D. C., radiator hose and packing; American Vulcanized Fibre Co., vulcanized fibre sheets; Goodyear Tire & Rubber Co., Philadelphia, Pa., rubber belting and belt clamps; the Gutta Percha & Rubber Co., New York City, rubber floor mats. The B. F. Goodrich Rubber Co., Akron, Ohio, sheet-packing diaphragm. The Goodyear Tire & Rubber Co., Washington, D. C., gasoline suction hose.

Ordnance Department of the Army—The Republic Rubber Co., New York City, cotton rubber fire hose; American Hard Rubber Co., New York City, hard rubber rod; Boston Woven Hose & Rubber Co., Cambridge, Mass., cotton rubber hose, etc.; Firestone Tire & Rubber Co., demountable tires.

Surgeon General of the Army—U. S. Rubber Co., Naugatuck, Conn., rubber bags and syringes; American Hard Rubber Co., New York City, laboratory equipment; Hay Stamp Co., Washington, D. C., rubber stamps.

Rubber Chemists to Meet in Cleveland

The Rubber Section of the American Chemical Society will meet in Cleveland, Ohio, during the week of September 10. The following is the program of the meeting:

1. "The Determination of Lamp Black," by A. H. Smith and S. W. Epstein.

2. "Laboratory Methods for Determining the Degree of Vulcanization." Discussion opened by D. F. Cranor.

3. "The Fruit Jar Ring Situation." Discussion opened by Chas. P. Fox.

4. "Vulcanization of Rubber at Constant and by a Series of Increasing Temperatures," by G. D. Kratz and Arthur H. Flower.

5. Report of the committee on the "Poisonous Nature of Some Accelerators and Precautions Regarding Their Use." Discussion opened by Dr. R. D. Earle.

6. Report of the Executive Committee; Dr. L. E. Weber, chairman.

Concerning the Rubber Trade

Phoenix Rubber Co., One of Younger Rubber Reclaiming Concerns, Adding to Model Plant—Gutta Percha and Rubber Co., Ltd., to Build—Hercules Rubber Co. Plans $12,000 Addition

Success of the Phoenix Rubber Co.

Reclaimed rubber is one of the most staple of the raw materials in general use by manufacturers of rubber goods, being a necessary part of compounds in a majority of lines and not dependent for volume on any one branch or department of the industry.

While practically all manufactured rubber goods contain some reclaimed rubber, only a small number of rubber factories are equipped to do reclaiming, for this work requires special equipment and process. This state of affairs has made the field fertile for concerns specializing in rubber reclaiming.

One of the most successful of the younger rubber reclaimers has been the Phoenix Rubber Co., Akron, Ohio, which, as was stated in the June 10 issue of THE RUBBER AGE AND TIRE NEWS, is now making a new and important addition to its model plant, situated in Akron, Ohio.

First established in 1917, the Phoenix Rubber Co. is now producing large quantities of standard "shoddies" and has brought out a number of special grades, including a special fiber stock for use in composition sole compounds and the well-known Phoenix No. 40 stock.

Much of the success of the Phoenix Rubber Co. is attributed to S. G. Rigdon, secretary and general manager, who prior to his connection with the Phoenix Co. was ten years with the Goodyer Tire & Rubber Co., Akron, Ohio, where he gained a wide acquaintance among rubber manufacturers, and to the experience and skill of J. G. Bretson, general superintendent, who has been in direct charge of the rubber reclaiming processes at the Phoenix plant since June, 1917. Mr. Bretson has had thirty years' experience in manufacturing and reclaiming of rubber, having been that long connected with the plant of the United States Rubber Co. in Cleveland, Ohio, and other factories, first as a hose maker and finally as general supervisor.

Gutta Percha & Rubber Addition

The Gutta Percha & Rubber Co., Ltd., 4 Yonge Street, Toronto, Ont., Canada, plans to build a new $40,000 factory on O'Hara Avenue, Toronto.

War Savings Stamps for Old Tires

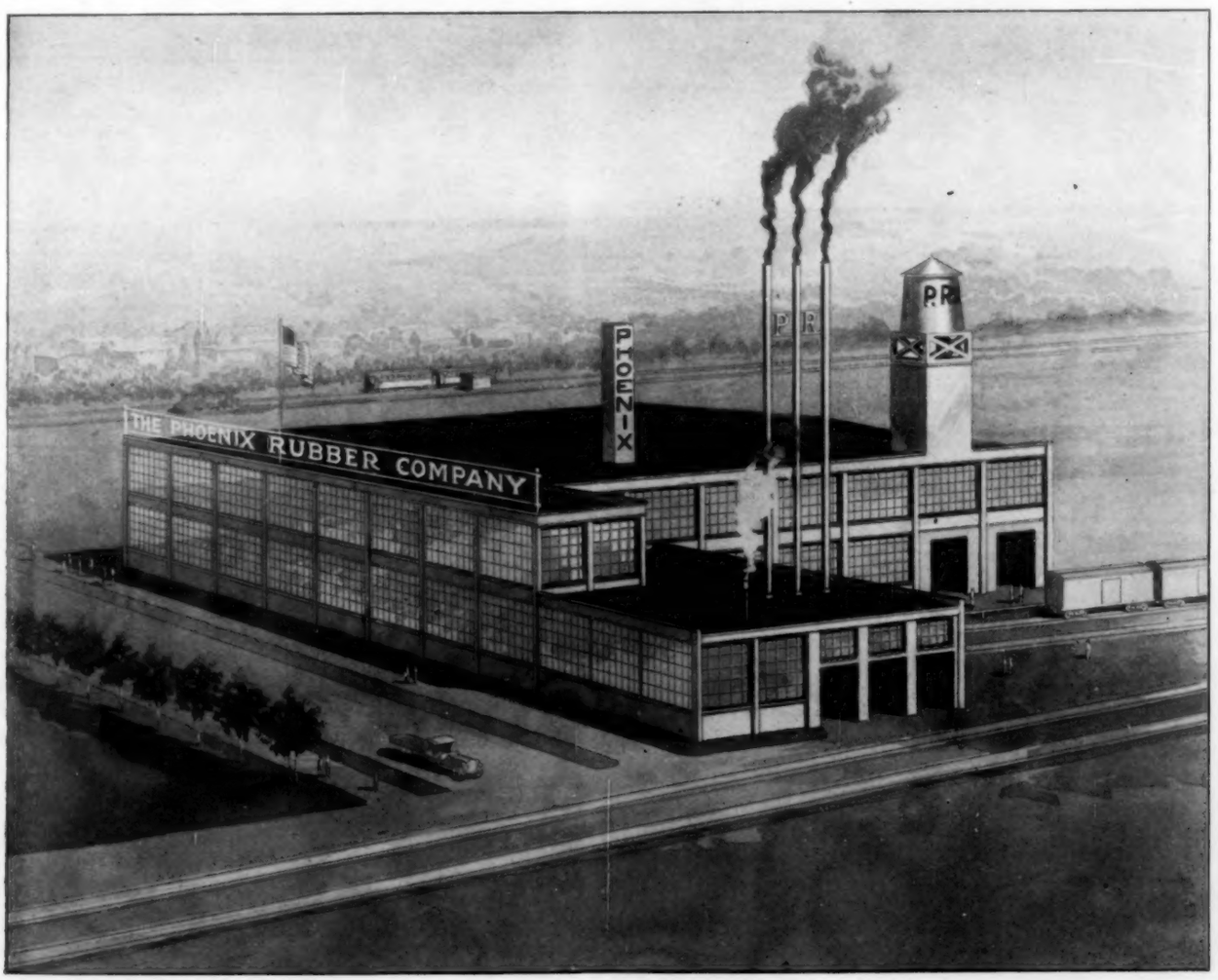
Old tires and automobile tubes are being used at Providence, R. I., in the war against the Kaiser by being weighed and sold to the junk men, who are giving War Savings Stamps in return for the rubber. All the tires are taken to one place and the rubber weighed, the junk man who bids the highest taking the lot and the owners being paid in proportion. This is said to be clearing out a lot of garages and turning discarded tires into money for their owners.

Goodyear School for Girls

An important department in the general offices of the Goodyear Tire and Rubber Company, Akron, Ohio, is the school for typists in which unexperienced girls are given a complete course of instruction and where the girls are paid a salary while under instruction. The course covers typewriting, spelling, business English and the complete routine of the office. Upon graduating the girls are transferred to the different departments needing their services. The Goodyear School has proved very successful and has supplied practically all positions for typists.

Hercules to Build Addition

The Hercules Rubber Co., Brampton, Ont., Canada, plans to build a $12,000 addition to its plant, according to a report from that city.



PLANT OF THE PHOENIX RUBBER CO.

American Rubber Patents

ISSUED JUNE 18, 1918

1,269,585—To Lewis Belden Dutcher, Oswego, N. Y. Automobile tire implements.

1,269,613—To Henry J. LaBauve, Austin, Tex. Combined automobile wheel and flexible tire.

1,269,628—To Peter Malacos, Wheeling, W. Va. Pneumatic tire.

1,269,629—To Beshara I. Malouf, Salt Lake City, Utah. Portable vulcanizer.

1,269,652—To Walter Shaw, Dedham, Mass., assignor, by mesne assignments to United Shoe Machinery Corp., Paterson, N. J., a corporation of New Jersey. Shoe.

1,270,247—To Oliver H. Cloyd, Peoria, Ill., assignor, by mesne assignments, to Crown Tire & Rubber Co., Ralston, Neb., a corporation of Nebraska. Tire and method of making the same.

ISSUED JUNE 25, 1918

1,270,253—To Albert E. Aker, Eldorado, Kans. Dust cap for tire valves.

1,270,310—To Milton McWhorter, Playas, N. M. Apparatus for compressing elastic fluid.

1,270,345—To James D. Tew, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, a corporation of New York. Soft base vulcanizing tube.

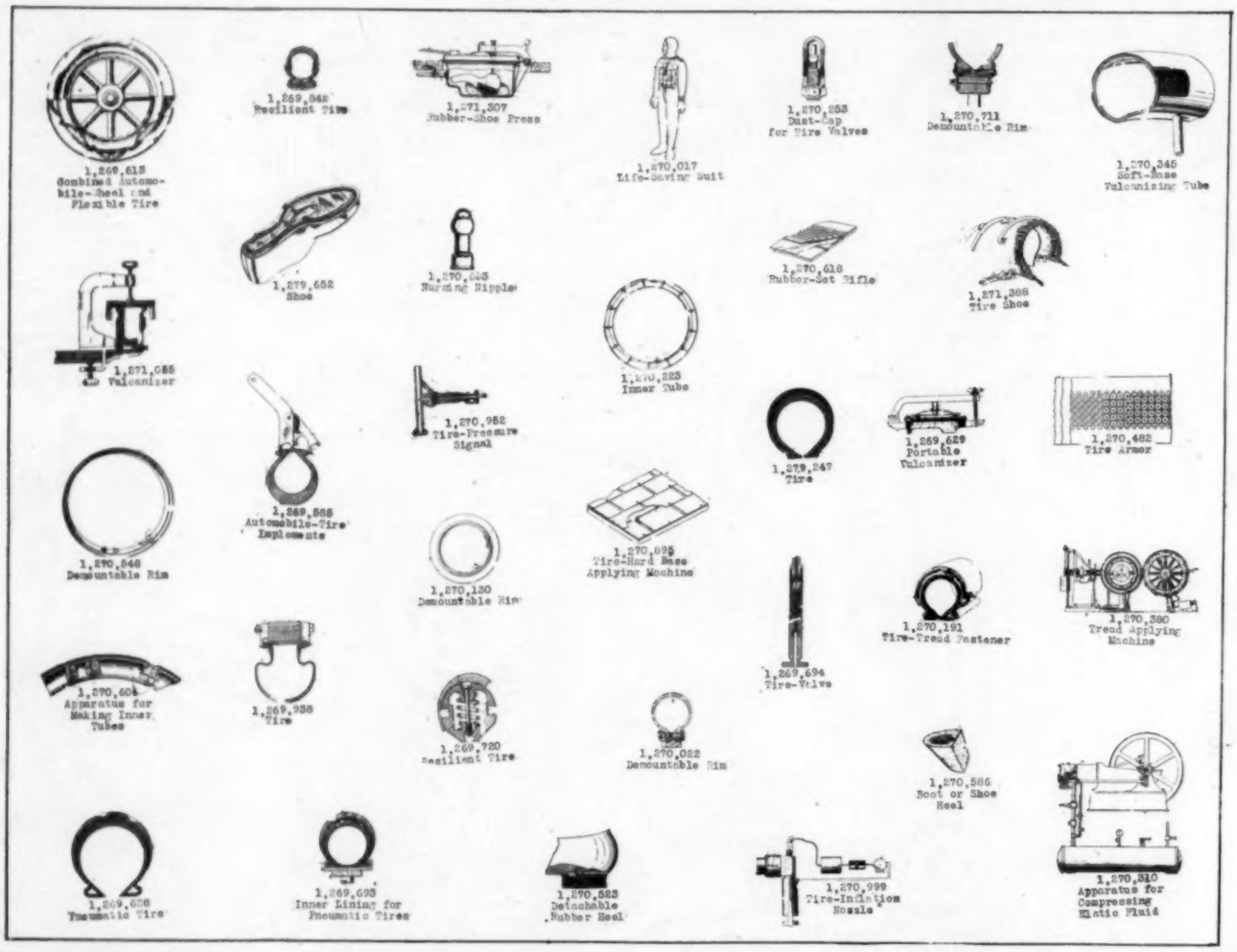
1,270,895—To William C. Stevens, Summit, Ohio, assignor to the Firestone Tire & Rubber Co., Akron, Ohio, a corporation of Ohio. Motor tire hard base applying machine.

1,270,952—To Guerdon O. Jones, Bouton, Iowa. Tire pressure valve and signal.

1,270,999—To Curles T. Wilson, Trenton, N. J. Tire inflation nozzle.

1,271,015—To Ernest Campbell, Calgary, Alberta, Can., assignor of one-half to Thomas Francis Cashman, Calgary, Alberta, Can., Tire sealing composition.

1,271,017—To John Hunter Cassidy, Montreal, Quebec, Canada. Life saving suit.



1,269,658—To Harry C. Trenaman, Hamilton, Ont., Can. Composition for waterproofing leather articles.

1,269,693—To Edward Hall Faile, Larchmont Manor, N. Y. Inner lining for pneumatic tires.

1,269,694—To William Curtis Faires, Mount Gilead, Ohio. Tire valve.

1,269,720—To John Henry Kossman, St. Louis, Mo. Resilient tire.

1,269,842—To William A. Neal, Lewisburg, W. Va. Resilient tire for automobile tires.

1,269,848—To Russell Parker, Brooklyn, N. Y., assignor to Parker, Stearns & Co., Brooklyn, N. Y., a corporation of New York. Process of making rubber balls.

1,269,938—To William O. Jeffries, Boston, Mass., assignor of one-half to Arthur F. Viano, Somerville, Mass. Tire.

1,270,022—To Alfred M. Doerfler, Medford, Mass. Demountable rim for wheels.

1,270,130—To Charles Edelen, Bardstown, Ky. Demountable rim.

1,270,191—To Lulan S. Morse, Oceanpark, Cal. Tire thread fastener.

1,270,223—To Vladimir Shavitch, Carmel, Cal. Inner tube.

1,270,232—To Christian Steenstrup, Schenectady, N. Y.; assignor to General Electric Co., a corporation of New York. Elastic-Fluid Turbine.

1,270,380—To Francis B. Converse, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y., a corporation of New York. Machine and method for applying rubber treads to pneumatic tires.

1,270,482—To Charles E. Bates, Chester, Pa. Armor for pneumatic tires.

1,270,523—To John A. Kaiser, Detroit, Mich. Detachable rubber heel.

1,270,548—To Louis H. Perlman, New York, N. Y. Demountable rim.

1,270,586—To Richard S. Ayres, Brookline, Mass. Boot or shoe heel.

1,270,591—To Max Beck, New York, N. Y. Cushion tire and method of making same.

1,270,604—To Henry Dech, Trenton, N. J., assignor to Mercer Tire Co., Trenton, N. J., a corporation of New Jersey. Apparatus for making inner tubes.

1,270,618—To Joe Horn, Los Angeles, Cal. Rubber-set rifle for ore-concentrators and the like.

1,270,693—To Edwin M. Caldwell, Edgewood, R. I., assignor to Davol Rubber Co., Providence, R. I., a corporation of Rhode Island. Nursing nipple.

1,270,711—To Huston R. Dugger, Murphy, Tex. Demountable rim.

ISSUED JULY 2, 1918

1,270,887—To Edward Mark Slocum, Medan, Sumatra, Dutch East Indies, assignor to General Rubber Co., a corporation of New Jersey. Process of coagulating latex and product thereof.

1,271,019—To Sealy Ephraim Clark, Gage, Okla. Tire protector.

1,271,055—To John Michel, Philadelphia, Pa. Vulcanizer.

1,271,154—To Charles Garrison, Brookline, Mass. Life preserver.

1,271,307—To John R. Gammeter, Akron, Ohio, assignor to the B. F. Goodrich Co., New York, N. Y. Rubber shoe press.

1,271,386—To Jack E. Taylor, Cleveland, Ohio. Tire shoe or casing.

Incorporations

Robert L. Ream Co., Dover, Del.; capital, $15,000; to deal in rubber goods.

Surety Tire & Rubber Co., Dover, Del.; incorporators: W. L. Burges, Otto L. Menzing, A. N. Koerner.

Wilson Tire & Accessory Co., Inc., New York City; capital, $10,000.

Kirchner Tire & Supply Co., Columbus, Ohio; capital, $10,000.

Mac Airless Tire Co., Phoenix, Ariz.; capital, $100,100; incorporators: E. Pomeroy, H. S. Standage and John T. Reese.

Avalon Rubber Co., Barberton, Ohio, has increased its capital from $50,000 to $200,000.

TIRE NEWS

Specifications for Solid Rubber Tires

The Motor Transport Corps now has jurisdiction over all matters connected with the design, construction, production and maintenance of all motors, parts and accessories used by the various departments and divisions of the Army.

The Engineering Branch of the Motor Transport Corps, under John Younger, has been devoting considerable time to the standardization of motor vehicles and their parts.

The G. M. C. ¾-ton and 1-ton trucks have been accepted as standards for these sizes; for 1½ and 2-ton trucks, the White has been selected as the Army truck, and the B or Liberty truck is to be standard for 3- and 5-ton trucks.

This standardization also has been extended to the tire and rim equipment. The Government standards for solid rubber truck tire sizes, for cars to be ordered in the future, are to be: 36 x 4, 36 x 5, 36 x 6, 36 x 7 and 40 x 6. The 34 x 4 size will in the future be purchased for renewals only, for some trucks already in service. All solid rubber truck tires are to be of the pressed-on type and are to be built to the Government standards hereinafter given.

1. *Type.* The tires to be furnished shall be either " pressed on " type or demountable as required by the purchasing Quartermaster in his instructions to bidders. The " pressed on " type of tires shall be provided with the standard channel base of tire manufacturers, and shall be suitable for pressing on to S. A. E. standard felloe bands. If the demountable type of tire is bid on, they shall be suitable for fastening to truck wheels by means of standard wheel fastenings shown on drawing T-101.

2. *Rubber.* The rubber compound shall contain not less than 65 per cent by volume of best quality wild or plantation " Heavea " rubber. If reclaimed rubber or mineral rubber is used, it must be in addition to the 65 per cent of new rubber required, and the manufacturer must declare the amount and kind of reclaimed rubber or rubber substitutes used in his formula. The use of " refined " or ground vulcanized rubber in the compound will not be permitted.

3. *Sulphur.* The total combined and free sulphur shall not be more than 8 per cent of the weight of new rubber used.

4. *Saponifiable Matter.* The rubber compound shall be free from saponifiable oils, or anything made from them.

5. *Chemical Tests.* Where chemical tests are used, they shall be made in accordance with the Bureau of Standards' methods.

6. *Tensile Strength.* The tensile strength of rubber compound shall not be less than 2000 lb. per square inch. Ten samples shall be cut from each tire under test, the samples to be cut in such a manner as to give the proper shape of testing strip for a testing of the stretch and set. The center of test sample shall be ⅛ in. thick by ¼ in. wide and 1 in. long. The samples shall be kept in the testing room until they obtain a uniform temperature of 70 deg. fahr. The average shall be taken on not less than ten samples. Pieces obviously defective will not be considered in calculating the average result. The average tensile strength of all tires tested shall not be less than 2000 lb. per sq. in.

7. *Stretch.* The 1 in. straight length of test piece above referred to shall stretch to total length of 4½ in. before breaking at a temperature of 70 deg. fahr. The sample shall be stretched at the rate of 20 in. per minute.

8. *Set.* The increased length of the 1 in. test section of rubber referred to shall be not more than 40 per cent of the original length two minutes after the rupture. The temperature of test samples to be 70 deg. fahr. If the tensile strength is 20 per cent more than the specified minimum, 5 per cent additional set will be permitted.

9. *Aging.* Prepare a flat sample of rubber to be tested; place in an oven for two hours at a temperature of 228 deg. fahr. After removing from the oven, allow to stand for 24 hours and cut out test piece and determine elongation. The reduction in elongation at the breaking point shall be not over 35 per cent.

10. *Adhesion.* The tread rubber in the " Barbecue " test must adhere to the hard rubber and the hard rubber to the steel channel, so that a strain of 100 lb. per inch of tire width will not cause separation. The Barbecue test shall be performed by cutting a diagonal cut in the tread rubber and extending the cut to the hard rubber base. The tread rubber shall be cut loose from the hard rubber base a sufficient distance to obtain a firm grip on the tread rubber with the slip loop of a strong rope. The rope shall be connected with a tension dynamometer, and suitable means provided for producing tension on the rubber under test. The tread rubber shall be pulled back in the opposite direction from its normal position on the tire, and the pull shall be made at a tangent with the outside of the tire.

11. *Rebound Test.* The rebound shall be not less than 45, as measured on the Whitney rebound instrument. The sample under test shall be held at 70 deg. fahr. for a period of 24 hours before testing and the instrument shall be mounted rigidly in a vertical position. The tire shall be hung on a solid anvil below the instrument.

12. *Number of Tires to be Tested.* One tire in each lot of five hundred (the tire to be selected by the inspector) shall be tested, and if the tire subjected to test fulfils all the requirements of the specifications, the lot of tires represented by it will be accepted, including the tire on which tests have been made. If the tire subjected to test fails to fulfil the requirements of the specifications in any particular, the lot of tires represented by it, including the tire on which tests have been made, will be rejected. If, however, the maker of the tires demands a further test, two more tires from the lot rejected will be selected by the Inspector, and if both tires are found satisfactory, the lot of tires represented by the tires subjected to test will be accepted and the United States will pay 50 per cent of the cost of tires on which tests have been made. If either tire fails in tests, the Inspector may, at the discretion of the company, select five additional tires for tests. If all five tires fulfil the test requirements, the

remainder of the lot of five hundred will be accepted, but in any case the tires tested will be free of cost to the Government.

13. *Marking.* All tires will have moulded on the side of the tread rubber, the tire size, i. e., the width and diameter, and also the rubber compound or specification number, the tire serial number, month and year of manufacture and name of the manufacturer.

14. The tires shall also have marked, by stamping deeply into the steel tire channel, the tire serial number and a symbol representing the name of the manufacturer. The above data shall be stamped under the overhanging edge of the steel channel.

15. *Section of Tires.* Full-sized drawings shall be submitted with proposals showing the exact section of the tires which it is proposed to furnish. Sample section of the actual tire in each size shall also be submitted.

16. The total sectional area of tread rubber in tires and also the area of tread rubber above the tops of steel channels must be definitely stated in proposals, and this data will be given due consideration in connection with the prices submitted.

17. *Grooving of Tires.* Tires 10 in. in width and larger shall be provided with approved grooving on face of tire.

18. *Guarantee.* The manufacturer of tires must guarantee them from separation of bond or any other defects in material or workmanship. This guarantee shall apply also to any tire channels which break at the weld when tires are being pressed on, except when felloe bands are larger than S. A. E. Standard.

19. Adjustments shall be made on defective tires for value received, to be determined by agreement or arbitration.

20. *Base Band.* The tire base band shall be made of open hearth steel and rolled to approximate finished dimensions. Chemical analysis shall be as follows:

Carbon	.12 to .22—.17 desired
Manganese	.35 to .55
Phosphorus	Less than .04
Sulphur	Less than .05

21. Base bands are to be electrically welded to a somewhat less diameter than when assembled to the wheel. They shall be truly circular and free from appreciable warp.

22. To determine the effectiveness of the welding process used, pieces of base band metal not less than 8 in. in length will be welded together, and three such welds pulled in a testing machine. The total pull required to separate each of the three welds shall be more than 45,000 lb. per square inch of cross section.

23. In order to determine whether the base bands are being properly welded in production, the inspector may, from time to time, require a weld on the finished tires to be tested in the manner described above. The strength of the welds in production shall be not less than 45,000 lb. per square inch of section.

24. *Preparation for Shipment.*

(a) Painting—Paint metal bases with rust-resisting paint.

(b) Wrapping — None required.

(c) Marking — Shipping instructions to be shown on printed label pasted to inside of tire band and with a protective coating of silisate of soda over the label.

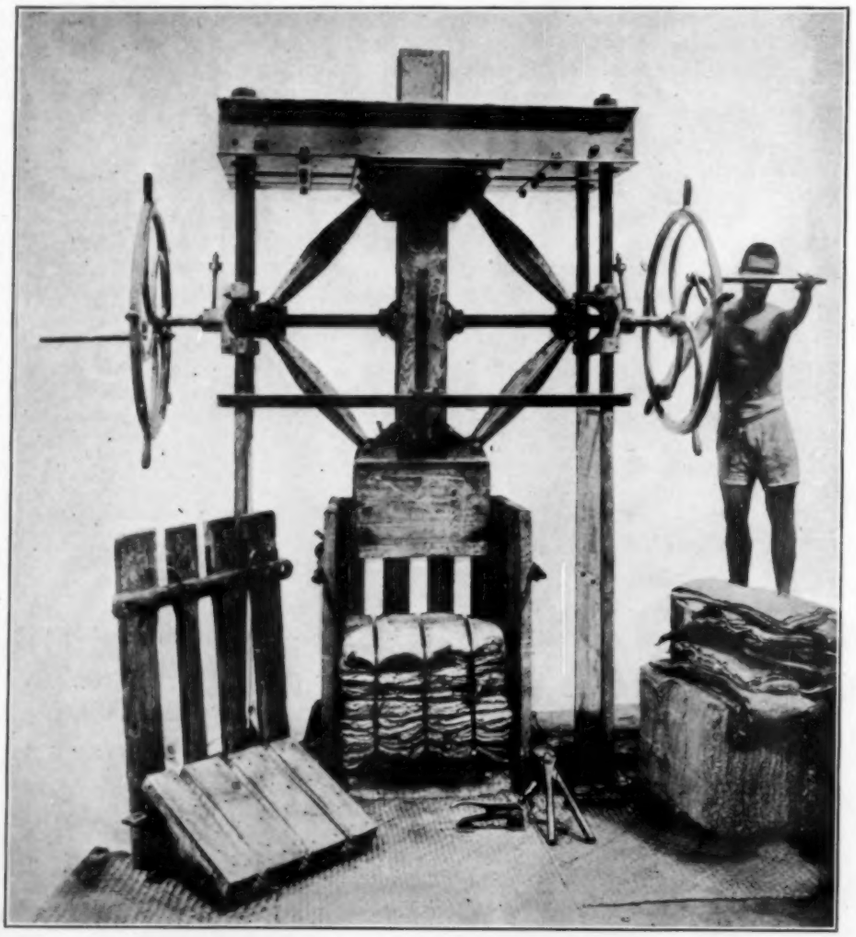
(d) Crating — No crates or bracing required.

Standard Army Sizes. The following are the United States Army standards for solid rubber truck tires: 36 x 4, 36 x 5, 36 x 6, 36 x 7, 40 x 6 and 34 x 4, the latter for renewals only. The sizes most used are 36 x 4, 36 x 5, 36 x 7 and 40 x 6.

Baling Rubber

Saving valuable cargo space in transporting crude rubber to this country from the Far East has been made possible by the introduction on the rubber plantations of the United States Rubber Co. of methods of baling rubber which increase the amount of rubber in each package from 20 to 30 per cent.

The United States Rubber Co. began baling its rubber on its great plantations in the fall of 1915, and has recently equipped its storehouses in Singapore with the improved baling machinery. The adoption of these new baling methods by other rubber companies has made it possible for the Government to permit the shipment of many tons of rubber which would otherwise have been denied importation because of lack of cargo space.



CRUDE RUBBER BALING PRESS USED BY UNITED STATES RUBBER CO.

News of the Tire Trade

New Tire Sales Plan—U. S. Rubber's Big Turnover—Williams Has New Sales Manager—Automobile Builders May Go On War Basis—Cycle Trade Organizes—Other News Items

The Mason Tire Sales Company

The Mason Tire Sales Company has opened a new store for the sale of tires at 19-21 Tenth Street, Wheeling, W. Va., and will market tires to the automobilist according to a plan whereby the user of tires will secure at low prices, a quality tire of national reputation—the Mason tire, manufactured by the Mason Tire & Rubber Company, Kent, Ohio.

The Mason Tire Sales Company is in charge of William F. Bruhn, a well-known Wheeling man. Mr. Bruhn has had a wide business experience and is well qualified to successfully handle the Mason Tire Sales Company. He has lived all his life in Wheeling, and was for a number of years with M. Marsh & Son, acting in the capacity of Assistant Manager.

In speaking of the Mason Tire Sales Company and its plan of marketing tires, Mr. Bruhn said: "I believe we are introducing a revolutionary plan of marketing our tires. There is no doubt that tire prices are too high. We recognized that fact some time ago and we gave serious study to the problem of how to reduce these prices. The cash basis on which we operate is a vital point in our plan. Charge accounts with their inevitable losses, bookkeeping costs and the extension of credits run up the cost of doing business so that most dealers are obliged to charge high prices for their product. We avoid all these expenses and the consumer correspondingly benefits. Our business is founded upon the theory that the average automobile owner would rather come into our store and pay cash for his tires and save about 25 per cent.

"We also maintain a separate department to fill mail orders quickly and accurately. Tires or tubes are sent by parcel post or express on the same day we receive the order. We allow the customer to return the tires or tubes within three days after they are sent if he is not satisfied with them and we return his money."

Big Increase in U. S. Rubber Earnings

The United States Rubber Co., New York, in first six months of this year earned $10,242,365, against $7,239,966 last year. This is at annual rate of improvement of over $6,000,000, against $5,000,000 in last year's extraordinary report.

Gross sales if maintained at volume of the first six months would mean for the full year close to $220,000,000, against $176,000,000 for 1917. But final figures are likely to run closer to $210,000,000, since January to June is always Rubber's big half year. Curtailment of tire production and further transition to a war basis will also figure to some extent.

After $2,500,000 for preferred dividends for the half year, there is a balance for common of approximately $7,700,000, or well over $21 a share.

Rubber common is earning at rate of nearly $43 per share, which means at rate of 70 per cent on its market price.

Goodyear's Enlisted Employe Policy

The policy of the Goodyear Tire & Rubber Co., Akron, Ohio, in regard to enlisted employes is the same as that of the other large rubber companies. It was erroneously stated in a recent issue of THE RUBBER AGE AND TIRE NEWS that the Goodyear Company was paying its enlisted employes.

Slater to Manage Williams' Sales

W. J. Slater, probably best known as "Bill" Slater, has resigned his position as pneumatic tire sales manager of the Firestone Tire & Rubber Co., Akron, Ohio,

WILLIAM T. SLATER

to become general sales manager of the Williams Foundry & Machine Co., Akron, Ohio, large makers of tire building and repairing equipment.

Mr. Slater's connection with the Firestone company covered a period of several years, during which he was successively manager of advertising, sales promotion director and pneumatic tire sales manager.

Commissions for Rubber Experts

Applications for service in a special officers' training camp at Jacksonville, Fla., will be received by the Quartermaster General of the Army until midnight, Aug. 20. Five hundred men above the age of 31 are wanted to qualify for commissions in the conservation and reclamation division.

Republic Declares Dividend

The Republic Rubber Co., Youngstown, Ohio, has declared its regular quarterly dividend of 1¾ per cent on first preferred stock, payable Sept. 1 to stockholders of record Aug. 25.

Firestone Quarterly Dividend

(*Special Akron Correspondence*)

Stockholders of the Firestone Tire & Rubber Co. have received an announcement that the directors have taken action necesary to insure a 6 per cent return on common stock for the current year. A quarterly dividend of $1.25 per share, payable September 20 to stockholders of record September 10, was declared at the directors' meeting and a special dividend of $1 per share will be paid to the same stockholders to cover the additional 1 per cent for the year.

In a letter to stockholders, the Firestone Co. estimates sales for the current year at $75,000,000.

Goodyear Preparing for War Cripples

The experience of every nation that has engaged in a great war shows that returning soldiers, after their vigorous military life, usually prefer and seek out-door occupations. A large number, of course, return to their former work, but after strenuous service in the army, the common vocations seem "tame" to many. After our civil war, thousands of soldiers settled the public lands of the West, and became pioneers in its life. In a large measure the rapid growth of our western country was due to the rugged virility of these men. Secretary of the Interior Franklin K. Lane is recommending the throwing open of land in the West to the large number of soldiers who will prefer a life in the open.

But there will be many soldiers returning both during and after the war, crippled in body and broken in health, who will not be able to endure the rigors of a pioneer life. The great factories of the country will soon be called on to furnish employment for these men. In anticipation of this condition, The Goodyear Tire & Rubber Company has begun a compilation of possible positions that can be held by crippled soldiers. The employment of these men will be a great aid to the country.

The Cycle Trade Association

At the eleventh annual midsummer convention of the allied cycle trades a central body known as the Cycle Trade Association of America was formed which will represent the industry before the United States Chamber of Commerce and the War Industries Board and cooperate with them in war time activities. H. S. Quine, of the Goodyear Tire & Rubber Co. and president of the Motorcycle and Allied Trades Association, championed the amalgamation resolution on the floor of the convention and was named one of a committee to perfect the working machinery of the new association. In his speech at the convention he declared that the time had now come for real action on the part of the cycle industry—that the big thing ahead was to win the war, with everything subordinated to this end. The war had completely changed conditions and the industry must adjust itself to the situation as it is, standing ready to make any sacrifice to help the Government in its great crisis. The resolution was unanimously adopted and subscribed to by every manufacturer represented.

Founded Sixty Years Ago

The sixty-first year of the commercial existence of Hagemeyer & Brunn, 82 Beaver Street, New York, one of the oldest import and export houses in the country, was begun on Aug. 3. The business was founded on Aug. 3, 1858, by J. W. Brunn, the grandfather of Ewart M. Brunn, who is the present owner of the business. In 1859 F. E. Hagemeyer entered the firm. For many years the house acted as shipping agents for a steamship line operating between this city and Portuguese ports, but during the last twenty years a general export and import business has been carried on. The latter consists mainly of crude rubber, cocoa, hides, nuts and oils. The principal export business of the house is done with South America and Portugal.

Lee Shows Substantial Earnings

The Lee Tire & Rubber Co., Conshohocken, Pa., has shown net earnings before taxes substantially in excess of $300,000 on a gross business of over $3,000,000 during the first six months of this year.

A Million Dollar Trainload of Rubber

The Tire Output Curtailment

To prevent any possible misunderstanding, the War Trade Board has requested the War Service Committee of the Rubber Industry of the U. S. A. to advise all manufacturers of pneumatic tires and tubes that their regulations of Aug. 1, 1918, calling for the reduction in production of pneumatic tires and tubes on basis of 50 per cent of corresponding period in 1917 applies to all manufacturers irrespective of how small their production was in that period, and also applies to manufacturers who began manufacturing this year. (This regulation does not include motorcycle, bicycle or pneumatic truck tires six inches and above).

Special consideration of individual cases of manufacturers in business only a part of last year or who began operations during 1918; also cases of manufacturers seriously affected by this or subsequent regulations out of proportion to other manufacturers in the industry, may be sought by application to H. T. Dunn, Chief of Rubber Section, War Industries Board, Washington, D. C.

In presenting such requests full data must be furnished. For example, in referring to the present curtailment order manufacturers should specify: Number of casings produced each month during 1917, and monthly average; number of tubes produced each month during 1917, and monthly average; number of casings produced each month during first half of 1918 and monthly average; number of tubes produced each month during first half of 1918 and monthly average; approximate number of casings and tubes which could be produced from materials on hand and on order in transit.

Pending any special rulings affecting individual manufacturers all regulations must be strictly complied with, *without exception.*

Rare Metals Acquires New Plant

The Rare Metal Products Co., Bloomfield, N. J., has acquired the plant of the Seton Chemical Co., on Cortland Street, Belleville, N. J., consisting of a 7-acre site fronting of the Erie Railroad, and a number of factories, and plans to operate same for the production of antimony and other rare metal products.

Akron Standard Mold Company

The Akron Standard Mold Co., Akron, Ohio, recently organized by Anderson Fleiter, is now operating almost to the full capacity of its plant.

A Million-Dollar Trainload of Rubber

A trainload of crude rubber estimated to be worth a million dollars recently left Point Richmond, Cal., bound for Akron, Ohio, and New York. This shipment of crude rubber arrived at San Francisco on the American steamship "Ecuador" of the Pacific Mail Steamship Co., and is said to have been the largest single cargo of rubber to arrive at that port.

The above photograph, taken at Point Richmond, shows the shipment leaving that place via the Atchison, Topeka & Santa Fe Railroad. The "Ecuador" was the first steamer put into service by the Pacific Mail Steamship Co. upon the resumption of their trans-Pacific business in August, 1916.

Fourth National Chemical Exposition

The Fourth National Exposition of Chemical Industries, to be held at the Grand Central Palace, New York, September 23 to 28, promises to be the greatest event of its kind ever held. The fact that the United States Government will take over the Grand Central Palace on October 1 for use as a hospital will not interfere with the holding of the exposition, preparations for which are well under way.

The program for the exposition is in preparation. There will be a series of symposiums on the "Development of Chemical Industries in the United States since July, 1914," and others on chemical engineering, acids, industrial organic chemistry, the ceramic and metal industries. There will also be a series of motion pictures relating to the symposiums and to other industrial subjects.

The list of exhibitors is nearly complete and includes the J. D. Devine Co., Buffalo, N. Y., manufacturers of vacuum driers and equipment for chemical manufactures; the Hunter Dry Kiln Co., Indianapolis, Ind., manufacturers of Hunter dry kilns, and other concerns well known to the rubber industry.

Miller to Expand

The Miller Rubber Co., Akron, Ohio, will take a contract in the near future which will make it necessary to employ 400 to 500 additional men and girls. Officials of the company decline to disclose the nature of the contract, but it is assumed that it is a war order.

Firestone Entertains Foremen

Several hundred Firestone factory foremen and superintendents recently were guests of H. S. Firestone, president of the company, at his old family homestead at Columbiana, Ohio.

Among the guests outside the organization was Mr. Thompson, representing the Government in its balloon activities. Another guest was Henry Ford, Detroit automobile manufacturer, from whom Mr. Firestone drew inspiration in his remarks to the men regarding the responsibility, individually and collectively, toward their work on war materials.

The trip was made by automobile. A program of sports under the Firestone athletic director, Ed. Day, was a feature. A chicken dinner was served under a huge tent on the lawn.

As Mrs. Firestone was unable to be present due to injuries received in a recent automobile accident, the Women's Missionary Society of the Reformed Church there presented Mr. Firestone with a cake to be given Mrs. Firestone with the best wishes of the society.

Akron on War Basis

Major W. E. Walkup of the 146th Regiment, who was rejected for overseas duty, is drilling the Home Guard organization at the B. F. Goodrich plant.

It is said that the Goodyear Tire & Rubber Co. is well on the road to adjustment to a war basis. Practically every product of the company is used extensively by the Government for war purposes.

Increase in motor truck tires alone more than offset any decrease in the demand for tires subsequent to the curtailment of production of tires for passenger automobiles. Demand in all lines exceeds production.

Restrictions on crude rubber importations will not affect Goodyear this year, it is said, as the company has on hand or in transit six months' supply.

Mineral Milling to Enlarge Plant

The J. C. Finck Mineral Miling Co., 101 Barton Street, St. Louis, Mo., well known to the rubber industry as producers of refined barytes, has purchased, through the Yeckel-Martin Real Estate and Mortgage Co., 12,000 square feet of ground facing on West Kosciusko Street, St. Louis, Mo. This ground adjoins the Mineral Milling Company's boiler plant and coal switch, and gives it convenient space to store coal to take care of its requirements during any emergency.

New Tires and Tire Accessories

New Kelly-Springfield Solids—A Practical Tube Deflator—A Convenient Display Rack—Mud Hooks—A New Steel Armor—A New Anti-Skid Device—Kimball "Steel Armor"

New Kelly-Springfield Solid Tires

Three new types of solid tires for motor trucks have been brought out by the Kelly-Springfield Tire Co. The new

LIBERTY TREAD

models are known as the Liberty, Caterpillar and High Profile. Each is for its own particular purpose, the Liberty being designed to meet the demand for giant single tires and has been approved by the War Department as the proper

CATERPILLAR TREAD

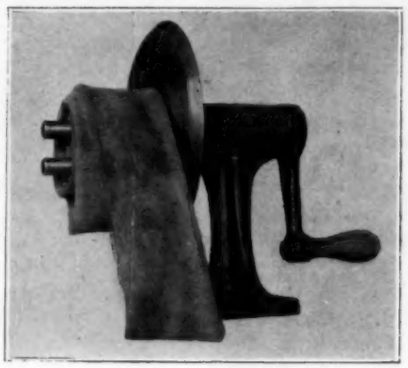
type for use on Army trucks. At the present time the Kelly-Springfield Tire Co. is offering the new Liberty tire in 36 x 10 and 40 x 10, but additional sizes will be ready for delivery shortly.

The Caterpillar tire combines all the advantages of the sectional block design and the endless type and is particularly adapted for heavy duty trucks operating in soft ground or over rough roads. It is a wide tread type with staggered slots cut in the edges of the tread somewhat along the lines of the early cushion tire. At the present time the size of this tire is 40 x 12. A 40 x 14 will be added shortly.

The High Profile tire will replace the present Kelly-Springfield demountable and pressed-on types. Kelly-Springfield sectional block tires are to be continued in both single and dual types as heretofore.

Akron-Williams Tube Deflator

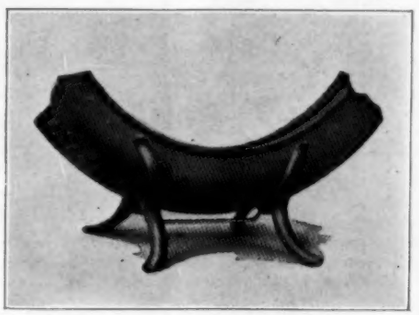
A very useful and time-saving device for the repair shop is the tube deflator of the Williams Foundry & Machine Co., Akron, shown on this page. According to the makers this device makes it possible to deflate any size tube in a few seconds. To accomplish this the valve plunger is removed and the tube is placed between the two small spindles at a point directly opposite the valve stem. A few turns of the handle exhausts the air. The deflator is very compact and sturdy, and may be placed anywhere in the shop without taking up valuable room.



TUBE DEFLATOR

Tire Display Rack

The value of a suitable rack for the display of tires is well known, and in order to fill this need the Ellis-Smith Mfg. Co., Inc., Buffalo, N. Y., has lately brought out an automatically adjustable rack which may be used for any sized tire, its weight causing the arms to grip and hold the tire firmly.

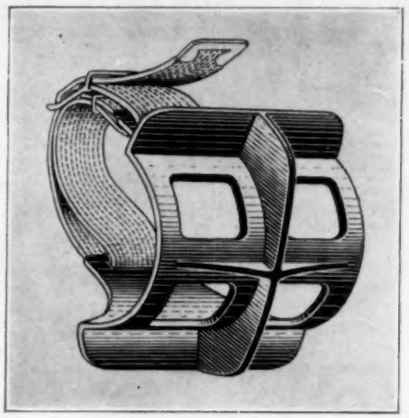


TIRE DISPLAY RACK

Fulton Mud Hooks

The Fulton Co., 1910 St. Paul Avenue, Milwaukee, Wis., is the manufacturer of the mud hook illustrated herewith. It is made of malleable iron, with strong web straps, and the claim is made that it will lift the car out of bad places in the road instead of digging it in deeper.

This device grips the tire firmly and cannot turn sideways and injure the tire



FULTON MUD HOOK

or get caught in the fender. In action, the makers claim, the mud hook tends to lift rather than to catch suddenly, and that consequently it does not stop the wheel with a jerk, injuring the differential gears.

Anti-Skid Clasp

This device is clasped tightly around the felloe and pressed against the tire by means of a cam arrangement operated by a lever. It is claimed that one of these mud chains will generally take a wheel out of a slippery place, but that for continuous running over a muddy road it is advisable to use four or six attached at equal intervals.

This device is made from flat steel, one-eighth of an inch thick, while the tread plate and links are two inches and one and one-quarter inches wide, respectively. There is a cam on one end and a loop on the other. The cam hooks into the loop when the device is put in place. A piece of leather is placed on the steel band where it comes in contact with the felloe to prevent it from marring the varnish.

The tread plate is corrugated to prevent slipping and has a surface four or five inches square pressing flat against the tire and cannot roll like the ordinary twisted chain and will not clatter when running on the pavement.

It is claimed that the hooks on the side hold the wheel from slipping, and that when the wheels sinks into the mud they cut the rut wider instead of sinking the wheel deeper.

Kimball "Steel Armor"

According to the manufacturer, this device, while preventing punctures, blowouts, rim cuts, and skidding, affects in no way the resiliency of the tire, and may be applied to a tire which is so badly worn that it would otherwise be useless.

The casing is made of flat steel links hooked together, and is put on over the tire and fastened into the rim the same way as the tire. Each section is two inches wide at the tread-plate and it takes about fifty bands or sections for a 32-in. tire. The treadplate is corrugated and provided with hooks, which protrude through the plate and thus prevent skidding.

MARKETS

Manufactured Rubber Goods

NEW YORK, August 24, 1918.

The cooler weather, following a spell of marked sultriness, has had a cheering effect on business since our last report, and generally speaking the trade is inclined to have a more optimistic view of the prevailing situation. Business continues good, and brisk fall trade is expected. Collections are all in all very satisfactory. The forthcoming new Liberty Loan and the proposed changes in the draft law are problems that are occupying the minds of the large organizations and the curtailment in tire production is causing much concern to small and medium-sized tire manufacturers. Needless to say that when the new draft begins to work, under which men from 18 to 45 will be included, decided changes may take place in the personnel of many organizations, and adjustments will have to be made in consideration of decreased man power. The prospect of a new loan campaign beginning early in the fall is also having its effect, exhibited chiefly in a tendency to hold available supplies of money until it is seen what demands must be met.

Exactly what effect the curtailment in tire production may have upon small and medium production tire factories is still uncertain. Some believe they will be forced to close down entirely, while others hope for a speedy adjustment and perhaps some Government work that will enable them to continue in operation.

The sulphur situation also is worrying rubber manufacturers.

Progressive changes are occuring in the terms on which business has been done in the past. For instance, some manufacturers are showing a tendency to make their contracts read f. o. b. mill instead of the buyer's location. There is also a tendency to reduce cash discounts to 1 or 2 per cent instead of 2 or 5.

Freight conditions have slightly improved, but the difficulty in obtaining materials and merchandise shows no change for the better. Manufacturing conditions are becoming more complicated every day. Prices during the past fortnight have not shown any decided change, although there have been small advances here and there in various lines of rubber goods.

MECHANICAL GOODS

The mechanical goods trade has not yet recovered from the vacation period and executives will be absent from their posts one after the other for another week or two. Their return will be awaited before the fall season is really begun.

The almost complete cessation of new building operations, except for Government and war essential purposes, continues to materially cut down the demand for rubber mechanicals.

The retail business in rubber hose has turned out better than most houses expected, though its volume has been somewhat disappointing. Manufacturers, however, have sold all the hose they could turn out for civilian purposes, for most of them have had large Government orders to fill. The quotations from jobbers' stocks, given in our last report, still hold.

DRUGGISTS' SUNDRIES

The usual mid-summer lull continues in the wholesale end of the druggists' sundries trade, but this year's totals will undoubtedly show a substantial increase in the volume of business over that of last year. A new factor in conditions this year is the constant shifting of business to a war basis, the Government and the Red Cross having become larger buyers than regular customers, and have caused manufacturers to abandon many lines to make room for their orders. However, good fall business is expected.

TIRES

There is no indication of any decrease in the consumers' demand for tires. In fact, the retail business in pneumatics and solids is larger in volume than it has been at any time during this season and, for that matter, any other. This activity no doubt is in part due to the fact that many users are making provisions for their future needs for many months. Fearing tire shortage many motorists are buying tires and tubes for their requirements for the next twelve months.

All manufacturers are retrenching. The Government's request for a curtailment in output is causing the factories to cut down their sales organization to the utmost limit to which it can be reduced. Branches no doubt will continue to be maintained by most manufacturers, but the expenses of these will be brought down to a strict minimum. Many expect the bulk of next year's business to be in truck tires, to which an increasing number of manufacturers are devoting their attentions.

Two price lists of pneumatic tires are published herewith to supplement the lists in the recent issue of THE TIRE RECORD OF THE RUBBER AGE AND TIRE NEWS. The list of the Mohawk Rubber Co., of Akron, O., is new, bearing the date Aug. 1, 1918, and replaces their earlier quotations. The second, that of the National Tire Co., of Trenton, N. J., is as of May 1, 1918. The list follows:

National Tire Co.

TRENTON, N. J.,
May 1, 1918.

Size.	Plain.	Non-Skid.	Red Tubes.
28x3	$13.80	$14.45	$3.40
30x3	13.40	14.10	3.35
32x3	17.95	18.80	3.80
29x3½	18.85	19.85	4.40
30x3½	17.45	18.25	4.20
31x3½	18.35	19.30	4.25
32x3½	20.40	21.40	4.30
34x3½	23.80	24.95	5.05
31x4	26.75	28.00	5.30
32x4	27.25	28.60	5.40
33x4	28.55	29.85	5.55
34x4	29.15	30.65	5.70
35x4	33.30	35.00	6.45
36x4	34.20	35.90	6.60
33x4½	38.05	39.95	6.80
34x4½	39.25	41.30	7.00
35x4½	41.10	43.10	7.15
36x4½	41.75	43.90	7.35
37x4½	47.80	50.20	8.35
35x5	46.90	49.25	8.70
36.5	53.10	55.70	9.50
37x5	49.65	52.15	8.95

The Mohawk Rubber Co.

AKRON, OHIO,
August 1, 1918.

Size.	Plain.	Non-Skid.	Ribbed.	Tubes.
28x3	$19.70	$23.75	....	$3.60
30x3	20.70	24.95	$22.20	3.75
Combination				4.00
30x3½	25.25	31.60	27.30	4.80
31x3½	27.95	32.75	....	4.95
32x3½	29.55	36.25	31.95	5.15
34x3½	32.25	39.55	....	5.50
31x4	37.45	44.00	40.40	6.05
32x4	39.65	46.85	43.10	6.15
33x4	40.80	48.05	44.40	6.40
34x4	42.30	49.90	45.70	6.60
35x4	43.70	51.60	....	6.70
36x4	46.15	54.50	....	6.90
32x4½	....	57.50	52.30	7.75
33x4½	49.65	58.75	....	8.05
34x4½	52.00	61.35	56.15	8.25
35x4½	54.20	64.00	58.55	8.40
36x4½	57.15	67.25	61.90	8.70
37x4½	58.50	68.85	....	9.05
35x5	64.85	76.45	70.55	9.85
36x5	67.40	79.75	....	10.15
37x5	69.00	81.50	74.40	10.50
36x5½	....	91.50	....	11.65
37x5½	80.00	94.50	....	12.00
38x5½	....	97.50	....	12.20

Cotton Yarn and Fabric

NEW YORK, August 23, 1918.

The market for raw cotton has continued to gain strength during the past two weeks, stories of the deterioration of the Southern crop being the main factor in the new strength of the market. In analyzing the condition of the growing crop, it appears that all the States east of the Mississippi River have good crops, some of them excellent. Beyond the river, Arkansas is beginning to suffer from drought and the crop is reported to have deteriorated to some extent. The same conditions apply in Oklahoma and Louisiana, and the crops in these two States are reported as just fair. Texas, which usually suffers most from lack of moisture, has lived up to custom this year, and the crop is reported to have been seriously damaged by drought. A few weeks ago prospects for the Texas crop were excellent, with a production of from four to five million bales estimated. This estimate must be sharply cut as the result of the poor weather. The cotton is reported opening moderately in the coastal region of all the Atlantic and Gulf States. The crop is early in all the States, and the damage from insects, including boll weevil, is said to be trifling. In spite of these adverse conditions, however, the crop is expected to be a fair sized one, inasmuch as the boll weevil has done little damage, and as the crop is an early one, little damage from

frost is expected. There has been some heavy trade buying on the local Cotton Exchange reported during the past two weeks, the representatives of mills covering their requirements before the market should advance further. There is also some foreign buying being done, notably by British and Japanese interests.

SEA ISLAND COTTON

The market for Sea Island cotton and Sea Island cotton yarns continues well sold up, and prices are more or less nominal. Definite information on the progress of the growing crop is lacking, but inclement weather conditions and the boll weevil pest are reported to be still damaging the crop.

EGYPTIAN COTTON

There have been no further arrivals of Egyptian cotton reported from Boston. Reports from the Corcoran section of California indicate a bumper crop of Egyptian cotton in that section. The growing of the Egyptian staple in this section was undertaken merely as an experiment this year, and the industry will be expanded should the crop be disposed of favorably. The Cotton Control Commission has established rules and regulations governing the sales of the 1918-19 cotton crop of Egypt, which is being disposed of under the supervision of the British Government. The regulations provide, among other things, that all cotton must be offered for sale through a person or firm in Alexandria.

FABRICS

The clothing needs of the army under the enlarged military program will necessitate huge amounts of wool and civilian wool consumers are finding it virtually impossible to purchase any woolens. Clothing manufacturers begining to make up their clothing for the spring trade next year have found it impossible to buy the necessary cloths. The maximum Government prices have been extended to cover print cloths, cotton blankets, ginghams, lawns, drills and many other fabrics.

TIRE FABRICS

Pending the announcement of official maximum prices to govern trading in this market, prices on the fabrics continue nominal with the trade generally quiet. The elimination of the manufacture of certain sizes of tires has slowed down the demand temporarily. No announcement regarding the fixed prices is expected before the 1st of September, as the War Industries Board will not take the situation under consideration until the last week of August.

HOSE AND BELTING FABRICS

The prices on regular hose and belting ducks have been established by the War Industries Board at 58 cents per pound for the 12 to 36 ounce grade, and 59 cents per pound for the 10 ounce hose ducks. The price on shelter tent ducks was fixed at 39 cents per yard for the 35-inch 1.95 grade and 36½ cents for the 36-inch 8¼ ounce duck. Practically the entire production of ducks is going to the Government for use in the manufacture of tents and equipment for all branches of the service. The shortage in webbing continues.

DRILLS, SHEETINGS, AND OSNABURGS

Since the maximum prices on cotton goods have been established, dealers report that the demand has not picked up nearly as much as six weeks' inactivity while waiting for the fixing of the prices would seem to warrant. With the present prices in force until Oct. 1, the business being done is merely routine, as buyers do not care to stock up, lower prices being forecasted for the next quarter. Prices on Osnaburgs have been fixed by the War Industries Board. Government needs continue to take large quantities of Osnaburgs from the market for use in camouflaging.

BURLAPS

The burlap market is weaker since the last report, dull trading having caused a reduction in prices. While there has been some demand from bag makers, the market has been generally dull. The only new development in the market is the announcement of the Government that it will require 2,500,000 yards of 10-ounce burlap for delivery the last quarter of the year. Importers are at present preparing bids on this quantity.

New York Quotations

TIRE FABRICS

17¼-ounce Sea Island, combed, sq. yd.		Nominal
17¼-ounce Egyptian, combed		Nominal
17¼-ounce Egyptian, carded		Nominal
17¼-ounce Peelers, carded		Nominal
17¼-ounce Peelers, combed		Nominal

DUCKS

Single Filling (pound basis)	lb.	.78
Double Filling (pound basis)		.79

DRILLS

37-inch	2.35-yard	yd.	.35
37-inch	2.75-yard		.30
37-inch	3.00-yard		.29
37-inch	3.25-yard		.27
37-inch	3.50-yard		.26
37-inch	3.95-yard		.22½
37-inch	2.00-yard Southern	lb.	.75
38-inch	2.00-yard Northern		—
40-inch	2.47-yard Northern	yd.	.35
40-inch	2.47-yard Northern		—
52-inch	1.90-yard Southern		.40
52-inch	1.90-yard Northern		.40

SHEETINGS

40-inch	2.35-yard	yd.	.38
40-inch	2.50-yard		.39
40-inch	2.85-yard		.33
40-inch	3.00-yard		.32
40-inch	3.25-yard		.18⅛
40-inch,	3.75-yard		.17⅜
40-inch	3.60-yard		.20
40-inch	4.25-yard		.15½
38-inch	Jacket Cloths	yd.	

BURLAPS
(Spot Carload Lots)

40-inch	8 -ounce	18.25@18.50
40-inch	10 -ounce	23.25@23.50
40-inch	10½-ounce	23.75@24.00

Chemicals and Compounding Materials

NEW YORK, Aug. 24, 1918.

During the past two weeks the market for chemicals and compounding materials has displayed a much quieter tone, but in the principal items the price tendency remained steady. Restrictions in rubber imports and consequential curtailment in the non-essential manufacturing of tires and rubber goods were the reason that new buying kept within very narrow limits, as even greater restrictions are expected when the present period runs off on October 1. Some items continue to be very hard to locate in sizable quanties, as the demand of the Government must be satisfied first. In some instances, however, resale lots were obtainable at slight recessions. Under the uncertain outlook manufacturers are more inclined to buy in a conservative way, and willing to await further developments. A strong upward trend in the antimony metal has so far not been reflected in higher prices for the sulphurets, but ultimately will cause a higher tendency.

ANILINE OILS

Firm prices are named with stocks for prompt or nearby shipments still low. Producers are not favorably situated for spot transactions and there are only small lots in the possession of second hands. Spot goods are quoted at the unchanged price of 28 @ 30c.

ANTIMONY SULPHURETS

A strong upward movement is under way in the needle antimony which is quoted at 14⅜ @ 14⅝c. a pound, under firm prices from primary centers. So far the antimony sulphurets, while firm have not participated in the upward tendency of the metal, but ultimately higher prices will be seen. The golden quality rules at 28 @ 30c. red is held at 25 @ 26c. and 45 @ 47c. is asked for the crimson material.

BENZOL

Leading producers are quoting from 25 to 30c. a gallon. A fair business is reported in some quarters. Supplies are plentiful and reaching consumers on regular orders.

CAUSTIC SODA

Trading remained rather quiet, but more confidence was expressed in the price outlook and offerings were relatively small. Second hands quoted prompt shipments from works at 4.35c. a pound. Sentiment appears quite bullish and significance is attached to reports of a shortage of supplies in first-hand quarters.

DRY COLORS

There is a firm undertone in the dry colors and prices hold steady. In several lines as the blues, present prices look rather high, but manufacturers are well under contract and see no reason to attempt to get in business by cutting prices.

LITHOPONE

While fixed prices are maintained presently there is every reason to believe that the price will be advanced next month under the increasing cost of production.

LEAD PIGMENTS

All the lead pigments continue firm under the scarcity in the basic metal, but no change has been made in the quotations. White lead basic carbonate is held at 10½c. per pound and the basic sulphate is quoted at 9½ @ 9¾c. In red lead demand of the Government is continuously on the increase and the undertone is firm.

OILS

Linseed oil remains firm as far as prompt shipments are concerned and the official quoting is still $1.90 per gallon, but some crushers will not do better than $1.92 per gallon for 5 barrel lots for prompt and spot oil. The Government requested that everyone has to curtail as much as possible on the consumption of linseed oil until the new seed crop reaches the crushers. No changes are reported for corn oil and prices are firm for the refined grade at 21.47 @ 21.67c. per pound in barrels New York delivery and for the crude grade at 17¾ @ 18c. a pound.

GLYCERINE

Refiners are feeling relieved following the removal of speculation from the glycerine market. Former uncertainties have been done away with and a stabilized market now exists in which the question of supplies of crude rests principally with the Government. Business was done at 61 @ 62c. per pound in drums.

STARCH

Higher cash corn has been reflected in an advance of 50c. per 100 pounds in the price of cornstarch which is quoted now at 4.62 @ 4.82c. a pound.

TOLUOL

Government needs are still absorbing the greater quantity of this material and

only small lots are finding their way into he hands of outsiders. Only 50 per cent of the amounts wanted for commercial consumption during August were released and a similar paring down of September releases is expected. Recently established Government prices still prevail where releases are made.

Prices Current for Chemicals, Fillers, Colors, etc.

Acetone	lb.	*.25½	@	.25¾
Accelerator, in drums	lb.	.85	@	1.00
Acids, Acetic, 56%	lb.	.11	@	.14
Carbolic, C. P.	lb.	.44	@	.46
Cresylic, 95%	gal.	1.15	@	1.25
Muriatic, 20 deg.	lb.	.02¼	@	.02½
Muriatic, 22 deg.	lb.	.02¾	@	.03
Nitric, 42 deg.	lb.	.09¼	@	.09½
Nitric, 40 deg.	lb.	.09	@	.09¼
Sulphuric, 60 deg.	ton	18.00	@	20.00
Tartaric, crystals	lb.	.93	@	.95
Aluminum Flake	**ton**	**28.00**	**@**	**30.00**
Aniline oil, bulk basis	lb.	.28	@	.30
Antimony, metal spot	lb.	14.37½	@	14.62½
Oxide	lb.	15.00	@	16.00
Sulphuret, red	lb.	.25	@	.26
Sulphuret, golden	lb.	.28	@	.30
Sulphuret, crimson	lb.	.45	@	.47
Asbestos	**ton**	**35.00**	**@**	**45.00**
Asphaltum, Egyptian	lb.	.20	@	.25
Domestic	ton	22.00	@	30.00
Barium sulphate, technical	lb.	.04½	@	.05
Sulphide	lb.	.07¼	@	.07½
Barytes, prime white imported	ton	*40.00	@	45.00
white, domestic	ton	33.00	@	38.00
off color domestic	ton	23.00	@	28.00
Benzol, pure, bulk	gal.	.25	@	.28
Beta-naphthol, sublimed	lb.	.85	@	.90
unsublimed	lb.	.65	@	.75
Blacks, Drop	lb.	.05½	@	.15
Ivory	lb.	.16	@	.30
Carbon, gas, cases	lb	.16	@	.25
Lampblack, R. M.	lb.	.15	@	.45
Mineral blacks	ton	35.00	@	45.00
Blues, Prussian	lb.	1.35	@	1.50
Soluble	lb.	1.40	@	1.60
Ultramarine	lb.	.14	@	.50
Browns, Umber, Turkey, burnt, powdered	lb.	.05	@	.07
American, burnt	lb.	.03½	@	.04
Cadmium sulphide, yellow	lb.	2.00	@	2.25
Carbon, bisulphide, bulk	lb.	.08½	@	.09
tetrachloride, drums	lb.	.28	@	.30
Caustic Soda, 76@78%	lb.	.04¼	@	.04½
Chalk, precipitated, extra light	lb.	.05	@	.05⅝
light	lb.	.04⅝	@	.05⅛
heavy	lb.	.03⅝	@	.04¼
China clay, domestic	ton	15.00	@	22.50
imported	ton	*20.00	@	40.00
Fossil flour	**lb.**	**.03¾**	**@**	**.05**
Gilsonite	ton	50.00	@	55.00
Glue, extra white	lb	.36	@	.45
medium	lb.	.31	@	.35
low grade		.24	@	.27
Glycerine, C. P. (drums)	lb.	.61	@	.62
Graphite, flake (bbl.)	lb.	.18	@	.20
powdered (bbl.)	lb.	.13	@	.15
Green, chrome, R. M.	lb.	.14	@	.20
Ground glass (fine)	lb.	.03½	@	.04
Hexamethylene	lb.	1.10	@	1.15
Infusorial earth, powd'd.	**ton**	**60.00**	**@**	—
bolted	**ton**	**70.00**	**@**	—
Iron oxide, red, reduced grades	lb.	.07	@	.08
red, pure, bright	lb.	.15	@	.20
Lead, red, dry	lb.	.11¼	@	.11½
sublimed	lb.	.09¼	@	.09¾
white, basic carb.	lb.	.10	@	.10½
white, basic sulp.	lb.	.09¼	@	.09⅝
Lime flour	lb.	.01¾	@	.02
Litharge	lb.	.10¾	@	.11¼
English	lb.	*.12	@	.13
sublimed	lb.	.09¼	@	.09⅝
Lithopone, domestic	lb.	.08	@	.09
Magnesia, carbonate	lb.	.12½	@	.13½
calcined, heavy	lb.	.11	@	.12
calcined light	lb.	.75	@	.80
Magnesite, calcined, pwd.	ton	50.00	@	65.00
Mica, powdered	lb.	.04¾	@	.05
Mineral rubber (asphaltum base)	**ton**	**80.00**	**@**	**115.00**
Naphtha, motor gasoline, (steel bbls.)	gal.	.24½	@	—
68 @ 70 degrees (steel bbls.)	gal.	.30½	@	—
70 @ 72 degrees (steel bbls.)	gal.	.31½	@	—
73 @ 76 degrees (steel bbls.)	gal.	.33½	@	—
machine (wood bbls.)	gal.	.42	@	—
Oil corn, crude	cwt.	17.75	@	18.00
corn, refined	cwt.	21.47	@	21.67
linseed (bbls.)	gal.	1.90	@	..
palm, Lagos	lb.	*.39	@	.40
pine, yellow	gal.	.50	@	.51
rapeseed, refined	gal.	1.75	@	1.80
rapeseed, blown	gal.	*1.90	@	2.00
rosin, first rectified	gal.	.62	@	..
tar (commercial)	gal.	.35	@	.36
Orange mineral, American	lb.	.14¼	@	.15¼
imported	lb.	*.15	@	.20
Paraphenylenediamine	lb.	3.50	@	4.00
Petrolatum, bbls., amber	lb.	.06	@	.07
pale yellow	lb.	.06½	@	.07½
Pine tar kiln	bbl.	12.50	@	12.75
Pitch	bbl.	6.50	@	—
Plaster of paris	bbl.	2.00	@	2.50
Red, Tuscan	lb.	.32	@	.40
Indian (reduced)	lb.	.07	@	.09
Standard	lb.	.12	@	.16
Rosin (common to good)	**@**			
280 lbs.	bbl.	11.20	@	—
Rotten stone, powdered	lb.	.02½	@	.04½
Rubber, substitute, black	lb.	.13	@	.17
white	lb.	.15	@	.24
brown	lb.	.20	@	.25
Shellac, fine orange	lb.	.75	@	.80
T. N.	lb.	.67	@	.68
Bleached ordinary	lb.	.65	@	.66
Bleached bonedry	lb.	.70	@	.71
Silex (silica)	ton	22.00	@	40.00
Soapstone, powdered	ton	15.00	@	25.00
Starch, corn, powdered	lb.	4.62	@	4.82
Sulphur, crude	ton	*50.00	@	..
refined, flour, per 100-pounds, in bbls.		3.85	@	4.40
roll		3.70	@	4.15
commercial		3.25	@	3.75
Talc, American	ton	20.00	@	40.00
French	ton	*30.00	@	35.00
Toluol, pure, in drums	gal.	1.50	@	1.55
Tripolite earth	**ton**	**60.00**	**@**	**70.00**
Turpentine, pure gum—spirits	gal.	60½	@	.60
wood	gal.	.54	@	.57
Venice, artificial	gal.	.12	@	.13
Vermilion, English	lb.	2.00	@	2.10
Wax, beeswax, crude yel.	lb.	.40	@	.42
ceresin, white	lb.	.22	@	.24
carnauba, No. 3	lb.	.70	@	.77
Montan	lb.	*.35	@	.40
ozokerite, black	lb.	*.65	@	.70
ozokerite, green	lb.	*.80	@	.90
Wax, Paraffin, refined, 118/120 M. P. (bbls.)	lb.	.12¾	@	.13
Paraffin, 123/125 M. P.	lb.	.13	@	.13¼
128/130 M.P.	lb.	.13⅞	@	.14⅛
133/136 M.P.	lb.	.15	@	.15½
Crude, 120/122 M.P.	lb.	.10	@	.10¼
124/126 M.P.	lb.	.10¼	@	.10½
Whiting, commercial	cft.	1.25	@	—
Alba	cwt.	1.25	@	—
Whiting, Paris, white, American	cwt.	1.50	@	1.75
English cliffstone	cwt.	1.75	@	2.75
Yellow chrome	lb.	.30	@	.35
Zinc oxide, States Brand		.10	@	—
horsehead brand	lb.	†.10¼	@	.10½
selected	lb.	†.10¾	@	.11
"XX red"	lb.	†.10¼	@	.12
French process, green seal	lb.	†.13½	@	.14¼
red seal	lb.	†.13	@	.14½
white seal	lb.	†.14	@	.14¾
Zinc substitutes	ton	35.00	@	40.00
Zinc, sulphide, pure	lb.	.06	@	.07

*Nominal. †Contract prices.

Crude Rubber

NEW YORK, August 24, 1918.

With conservation of crude rubber supplies in full operation and importations cut down to monthly allotments of 8333 tons, the market in consequence is representing a very quiet front. By the end of September the War Industries Board will have sufficient statistical material on hand to determine whether the curtailment of 50 per cent ordered in the manufacture of pneumatic tires has been effective enough to save sufficient crude rubber needed for the essential industries. There has been some free rubber offered in the open market by manufacturers affected by the curtailment in tire output, but this relatively small tonnage has been readily absorbed. Allocations for August-September shipments are all in the hands of manufacturers, but the War Industries Board has decreed that 50 per cent of the allocated tonnage has to be taken in Brazilian grades, and the other 50 per cent in Plantation grades.

It is not only the shorter haul which favors the Brazilian grades, but also the more important condition of our growing export trade with Brazil, which must be protected by taking its products in return. This means that we will take the Brazilian grades practically at the same rate as before the restricted imports went into effect, and that the entire burden of the restriction falls upon the Plantation grades, which will be imported at the monthly rate of 4166 tons. Under those complications it is no surprise that the Singapore market is demoralized and that Plantation rubber pressing for sale is offered in some instances below production cost. There are instances reported when importers were able to lay down first latex crepe at 32½c. a pound at New York. As the rubber growers are facing ruin if those conditions continue any longer it is reported that the British Government is contemplating to fix a minimum price on rubber, below which no planter will be allowed to sell. First latex crepe for importation is quoted at 37c. and smoked sheets ribbed are held at 35c., those prices being 26c. below the fixed maximum prices.

Para rubber for imports are in contrast much firmer than the Plantation grades and the difference between the fixed prices and shipment prices amounts to only 7c. as the up-river fine grades is held at 61c. against a maximum price of 68c. Centrals are favored like Paras and remain firm for future shipments. Quotations:

	Spot.	Aug.-Sept.	Oct.-Dec.
Para—Up-river fine	68	61	..
Up-river medium	63	54	..
Up-river coarse	40	32	..
Caucho ball	40	32	..
Islands fine	59	54	..
Islands coarse	27	26	..
Cameta	28	27	..
Madeira fine	69	..	..
Ceylons-smoked sheets, ribbed	62	62	35
Smoked sheets, plain	60	60	33
First latex pale crepe	63	63	37
Amber crepe	60	60	36
Clean brown crepe	58	58	32
Centrals—Corinto, prime	39	37	..
Esmeralda, prime	39	37	..
Mexican scrap	35	35	..
Balata sheets	97	..	..
Balata, block Panama	59	..	..
Guayule	35	35	..
Africans—Rio Nunez, string	55	..	..
Massai, red	55	..	..
East Indian Pontianak	15	..	..
Palembang	16	..	..

* Nominal.

Scrap Rubber

There continues to be little or no activity in the scrap rubber market. Reclaimers show no interest at all, and dealers generally are only making necessary purchases. However, prices are holding rather firm all along the line.

Warehouses are packed full of old tires and tire scrap and tubes are very slow sellers. Little or nothing is being done in hose.

The following prices have been quoted for scrap f. o. b. the reclaiming mill:

Boots and shoes	8¾	@	9
Arctics, trimmed	6½	@	6½
Arctics, untrimmed	5¼	@	5½
Tires—Automobile	5¼	@	5½
Bicycles, pneumatic	5	@	5⅛
Mixed hose	2	@	2⅛
Air brake	5¾	@	6
Inner tubes, No. 1	21⅛	@	22¼
Inner tubes, No. 2	11	@	11¼
Inner tubes, red	11	@	11¼